

BARK BEETLE CONDITIONS

NORTHERN REGION

2004

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REGIONAL SUMMARY

Although late fall has turned out to be atypically dry, most of the Region received above normal amounts of precipitation during calendar year 2004. Most of Montana, and especially the eastern portions, have not completely broken out of the 4- to 5-year drought; however, growing conditions for most bark beetle hosts improved markedly throughout the Region. Despite improved conditions, long-term drought affects are not easily overcome. Too, many bark beetle species are at extremely high levels and will not respond to improved host conditions for a year or so. Those latter two factors combined to result in an increase in infested area by most bark beetle species across the Region. Unfortunately, less-than-optimal weather conditions late in the season prevented aerial survey of all beetle-infested areas. Approximately 85% of the forested portions of the 24 reporting areas were flown. While some areas appeared to be less impacted, for most of the Region, and particularly Montana; both aerial and ground-collected data showed still-increasing bark beetle infestations for most species.

Mountain pine beetle-infested areas increased in many locations surveyed; however, in some locations, intensity of beetle-caused mortality is declining due to host depletion. Decreases in infested area recorded on the Lolo National Forest (NF), however, is a reflection of the amount of area flown—not necessarily an indication that the outbreak, overall, is waning. In total, considerably more infested acres were recorded in 2004 than in 2003; despite some heavily infested areas having not been flown. Much of that total infested area was recorded in whitebark pine stands, where outbreak extent and intensity increased significantly. In all, it is likely that total infested area, throughout the Region, is actually much higher than recorded.

Douglas-fir beetle-infested acres decreased in northern Idaho and parts of northwestern Montana; but increased in southwestern and central Montana. Overall, infested acres increased in 2004, and beetle activity remained high in many areas. Grand fir mortality attributable to fir engraver once again increased to all-time high levels; and western balsam bark beetle-killed subalpine fir was mapped on more acres than ever recorded. Now, as we look forward to 2005, we are hopeful of continuing the recovery from the droughty conditions of the past several years. With continued near-normal weather, we are cautiously optimistic we may see bark beetle populations begin to decrease in intensity, if not extent. A relatively warm and dry winter, followed by another unusually dry spring, would likely result in expansion of most bark beetle-infestations through the coming year.

Mountain Pine Beetle (MPB):

The infested area mapped in 2004 increased significantly in many parts of the Region, despite several of the more heavily infested areas not being flown. With the exception of the St. Joe reporting area, most areas in northern Idaho reported increases. In western

Montana, most areas also showed an increase in infested areas. One exception was the Lolo NF reporting area; however, some of the most heavily impacted areas—Plains/Thompson Falls and Superior RDs—were not flown. On the Deerlodge and Flathead NFs, where most affected areas were flown, infested area increased once again. Acres on which beetle-caused mortality was recorded—in all species and on all ownerships—increased considerably, to more than 675,300 acres. More than 496,200 acres had been recorded in 2003. The figure recorded this year is the highest total infested area in the Region since 1988. Had all infested acres been mapped, we likely would have exceeded 700,000 acres. On those infested acres, more than 3 million trees were killed in 2003—recorded as faders in 2004. Nearly 90% of those were lodgepole pine. Although beginning to decline in some host stands, beetle populations are still expanding in many areas. As many as 80 new attacks per acre (in lodgepole pine) were found in one area surveyed.

A significant increase in beetle-caused mortality was noted in whitebark pine stands—especially on the Gallatin and Beaverhead NFs and in Yellowstone National Park (NP). While parts of the Beaverhead NF and Yellowstone NP were not flown, we know from ground observations that infestations increased substantially in those areas.

Many susceptible lodgepole, whitebark, and ponderosa pine stands remain in the Region. Unless weather patterns change to ones more favorable to their host and less conducive to beetle survival and population expansion, or management activities reduce the availability of susceptible hosts, MPB populations and resultant tree mortality will continue until few susceptible hosts remain.

Douglas-fir Beetle (DFB):

Despite a few local increases, DFB populations once again declined in most parts of northern Idaho. Notable decreases occurred on the Nez Perce and Kaniksu NFs, while modest increases were mapped on the Coeur d'Alene and Clearwater NFs. Overall, the infested area in North Idaho decreased from 12,200 acres in 2003 to slightly less than 9,000 acres in 2004. Few currently infested trees were observed in areas surveyed in northern Idaho.

In western Montana, infested stands on the Flathead and Kootenia NFs showed static or declining populations. In many areas, beetle-killed trees were still obvious; but seldom did we find higher numbers of new attacks in 2004 than in 2003. Stands surveyed in and around areas affected by the 2000 fires on parts of the Bitterroot and Helena NFs showed still-high populations and increased new attacks in many areas in 2003. Infestations on the Bitterroot NF, however, showed indications that populations may at last be declining. The infested area recorded on aerial detection surveys declined from more than 34,500 acres in 2003 to slightly less than 31,000 acres in 2004. That is still the most heavily impacted reporting area in the Region. Ground surveys and observations showed fewer areas with high amounts of currently infested trees. Surveys conducted on the Deerlodge, Helena and Lolo NFs showed significant increases in infested areas. Some of those were still heavily infested with trees attacked in 2004; however, some of those recorded increases occurred because not all infested areas were not surveyed in 2003. On the Gallatin NF, populations remained high in some stands, and a few observations showed

unusually late attacks in some areas. Trapping results also indicated later-than-normal flights in a few infested stands elsewhere. It will be of interest to follow these outbreaks. DFB does not typically overwinter as larvae and survival may decline as a result of late egg deposition.

Region-wide, the infested area mapped increased to more than 101,400 acres; up from 88,780 acres in 2003. In some stands, particularly on the Lolo, Deerlodge, and Gallatin NFs, populations appear to be still increasing.

Worthy of note, in some areas of western Montana, small-diameter Douglas-fir have been killed over the past 2-3 years, with damage attributed to DFB. Ground observations have shown that many of those—in the 6-inch to 10-inch diameter classes—have in fact been killed by Douglas-fir pole beetles (*Pseudohylesinus nebulosus* [LeConte]), the flatheaded fir borer (*Melanophila drummondi* [Kirby]), or combinations of both. Both those beetles regularly respond to drought-stressed trees. As an aside, many smaller-diameter western larch have also been recently killed by the flatheaded fir borer.

More than 2 million acres of Douglas-fir, older than 100 years, exist in the Region. Weather and stand disturbances—fire, defoliation, or wind throw—increase the likelihood of DFB outbreaks in susceptible stands. Preventive management is the key to reducing outbreak potential.

Western Balsam Bark Beetle (WBBB):

The number of acres on which subalpine fir mortality, attributed to WBBB, were recorded increased markedly in 2004; and still portions of the Beaverhead NF, where beetle populations have recently been high, were not flown. In the areas surveyed, more than 175,300 acres were infested—compared to 142,700 acres in 2003. An estimated 371,000 subalpine fir were killed. In many areas, populations are still increasing, and will continue so long as susceptible stands and favorable weather provide such conducive conditions.

Fir Engraver (FE):

Grand fir stands, in which FE-caused mortality was recorded, increased to yet another all-time high in 2004. Most stands in which grand fir was a significant component, in northern Idaho and western Montana, showed high levels of infestation. Total infested area exceeded 298,650 acres in 2004. Last year's previous high infested-acres total of 164,200 acres was nearly doubled this year. Nearly 253,000 grand fir were estimated to have been killed in 2003 (recorded as faders in 2004). We believe these dramatic increases in FE-caused mortality are still drought related; despite a better precipitation year in 2004. Unless we return to more normal long-term precipitation patterns, beetle-caused mortality will likely continue.

Others:

Pine engraver beetle (IPS) populations, and associated tree mortality increased substantially in ponderosa pine stands in the Region, but most of those increases were

noted on the Flathead IR in western MT. There, the infested area increased from 1,800 acres in 2003, to more than 14,000 acres in 2004. Elsewhere in the Region, populations were static or declined slightly. Still, faders were recorded on just over 17,000 acres this year; compared to slightly more than 6,100 acres in 2003.

Spruce beetle (ESB) populations remained at endemic levels throughout Idaho and Montana. In no reporting area were more than 100 infested acres recorded. We know the outbreak recorded east of Yellowstone Lake in Yellowstone NP, mapped at more than 8,700 acres in 2003 still exists; however the Park was not flown in 2004. We are unsure of its current extent.

Western pine beetle (WPB)-caused mortality, still relatively low for our stand conditions, declined to about 10,300 acres in 2004. More than 12,800 infested acres had been recorded in second-growth ponderosa pine stands in 2003. All but a few hundred of those acres were mapped in northern Idaho. An estimated 30,000 trees have been killed in those stands within the past two years. We anticipate continuing declines if precipitation patterns approach normal conditions.

**Table 1. Acres of Host Type Infested by Bark Beetles¹, 2002-2004
(x 1,000)**

	North Idaho²			Montana²			Region-Wide		
Host/Beetle	2002	2003	2004	2002	2003	2004	2002	2003	2004
DF/DFB ³	36.5	12.2	8.9	60.2	76.5	92.5	96.7	88.7	101.4
ES/ESB	0.2	0.6	0.2	6.2	9.5	0.2	6.4	10.1	0.4
GF/FE	110.0	143.7	264.3	8.9	20.6	34.4	118.9	164.3	298.7
PP&LPP/IPS	1.2	1.2	1.0	0.5	5.0	16.1	1.7	6.2	17.1
PINE ⁴ /MPB	256.3	190.1	221.9	261.3	306.1	453.3	517.6	496.2	675.3
SAF/WBBB	56.8	66.7	41.6	112.0	76.0	133.8	168.8	142.7	175.4
PP/WPB	5.8	12.0	9.9	0.9	0.8	0.4	6.7	12.8	10.3

¹ Estimates are from annual aerial detection surveys. Bark beetles were assumed to be the primary mortality-causing agent by aerial observer. Rarely have subsequent ground surveys shown otherwise. Only 85% of the forested areas in the Region were surveyed in 2004.

² Figures for ID include that part of the IPNF in Washington; figures for MT include Yellowstone NP. The Park was not flown in 2004.

³ See note below for beetle and host abbreviations used throughout report.

⁴ All MPB hosts: LPP, PP, WWP, WBP/LP (In 2004, infested acres by host were: 516,275; 39,112; 5,669; 111,545; respectively.)

The following abbreviations, for bark beetles and their hosts, are used throughout this report:

Beetles:

DFB: Douglas-fir beetle, *Dendroctonus pseudotsugae* Hopkins
MPB: Mountain pine beetle, *D. ponderosae* Hopkins
ESB: Spruce beetle, *D. rufipennis* (Kirby)
WPB: Western pine beetle, *D. brevicomis* LeConte
RTB: Red turpentine beetle, *D. valens* LeConte
IPS: Pine engraver, *Ips pini* (Say)
FE: Fir engraver, *Scolytus ventralis* LeConte
WBBB: Western balsam bark beetle, *Dryocoetes confusus* Swaine

Hosts:

LPP: Lodgepole pine
PP: Ponderosa pine
WBP: Whitebark pine
WWP: Western white pine
LP: Limber pine
DF: Douglas-fir
GF: Grand fir
SAF: Subalpine fir
ES: Engelmann spruce

Reporting Area summaries follow. For each, bark beetle effects on their respective hosts are noted. To the extent possible, we have indicated areas affected, an estimate of impacts, and beetle population trends. Though reporting areas are typically designated by names of National Forests, Indian Reservations, or National Parks; there may be within those reporting areas, lands of various ownerships—federal, state and private.

BARK BEETLE CONDITIONS IN MONTANA

Beaverhead Reporting Area

Dillon RD:

The only portion of the District flown in 2004 was the East Pioneer Mountains, northwest of Dillon. There, widely scattered, small groups of MPB-killed LPP were recorded as well as fewer, but numerous groups of DFB-killed DF, WBBB-killed SAF, and MPB-killed WBP. Groups of faded trees were observed from about Rock Creek on the north to Clark Canyon Reservoir on the south. Most beetle-killed WBP was recorded in high-elevation stands both north and south of Bannock. Several other groups were mapped east of Earls Gulch. The portion of the District in the West Pioneers and Beaverhead Mountains was not flown; however, historically the most prevalent bark beetle-caused mortality recorded in those areas has been attributed to WBBB in SAF stands. Because of the prevalence of WBBB activity in other areas, we can only assume it is continuing in susceptible stands not flown as well.

In the Blacktail Mountains and near Axes Canyon, other widely scattered and small groups of DFB-killed DF, LPP and WBP killed by MPB, and WBBB-killed SAF were observed. District-wide, for the area flown, DFB-killed trees were recorded on about 440 acres, MPB-killed LPP on almost 820 acres and WBP on nearly 200, and almost 1,400 SAF were killed by WBBB on 500 acres. We are confident many more acres of bark beetle-killed trees existed on areas not surveyed.

Wise River RD:

A small portion of the District, north of Wise River was flown in 2004. There, WBBB remained the single most important agent of mortality in SAF stands on the District; however, numerous small groups of DFB-killed DF were also observed. Most of the rest of the District was not flown. In past years, many groups of faders were recorded in the Pioneer Mountain Range, from the Big Hole River south to Elkhorn Springs. Mortality in those areas likely continued. Also throughout that area, generally in the Wise River drainage at lower elevations, many groups of DFB-killed DF were mapped. In the few areas surveyed, DFB-caused mortality was observed on almost 600 acres; SAF killed by WBBB were recorded on just over 600 acres.

Wisdom RD:

The District was not flown in 2004, but as in other parts of the Forest, we are certain WBBB remained the most significant mortality-causing agent. SAF stands throughout the Beaverhead Mountain Range, along the Montana/Idaho border have been infested to greater or lesser extents. Notable concentrations have recently been mapped in the Ruby Creek drainage, west of Wisdom; and in the Beaver Creek and Thompson Creek drainages in the Anaconda Range to the north. In 2003, almost 1,000 beetle-killed SAF were recorded on about 600 acres.

Widely scattered DFB-caused mortality has been of less significance in the past few years, and likely remained present in many stands in 2004. In 2003, mortality attributed to DFB totaled 2,200 trees on 1,300 acres. A DFB trapping project in the vicinity of Steel Creek showed nearly static beetle populations—number of new attacks were virtually the same as previous-year hits.

Madison RD:

Most of the Tobacco Root Mountains and SAF stands in the Gravelly Range were not flown in 2004; however, in the past couple of years, SAF mortality attributed to WBBB had reached extremely high levels throughout the District. Some stands were more heavily impacted than others, but it appeared there were few SAF stands on the District not affected to some extent. Relatively small groups—up to 100 trees each—were reported in the Tobacco Root Mountains to the north. To the south, throughout the Gravelly Range, extremely large groups of faders—covering as much several thousand acres each, and averaging an estimated 3-5 trees per acre—were mapped within the past two years.

In 2004, the largest concentrations of WBBB-killed trees were mapped south and west of Ennis in the Ruby Range, throughout the Snowcrest Range, and in the southern end of the Gravelly Range. Total affected area on the District was estimated at 9,700 acres on which an estimated 10,700 trees were killed.

Large groups of WBP, killed by MPB—much increased over the past couple of years—were recorded in the southern portions of the Gravelly and Snowcrest Ranges.

Elsewhere, there were lesser amounts of DFB-killed DF, and MPB-killed WBP scattered throughout the reporting area. DFB-caused mortality and LPP killed by MPB was especially noticeable in the West Fork Madison River drainage.

To the south, in the Centennial Range, on lands administered mostly by BLM, large amounts of SAF, killed by WBBB, were still present, but decreased from 2003. In that same general area, significant amounts of WBP killed by MPB were recorded. Lesser amounts of LPP have been infested by MPB. Largest groups of SAF faders were noted west of Nemesis Mountain and totaled almost 3,100 trees on 1,400 acres; while most MPB-caused mortality was to the west of there. Total MPB-caused mortality, in both LPP and WBP, exceeded 35,000 trees on 13,400 acres. Small amounts of DFB activity were observed at a few lower-elevation sites.

Total aerial survey estimates for the Beaverhead Reporting Area, on lands of all ownerships, showed nearly 5,000 acres infested by DFB; 43,400 acres infested by MPB (all hosts); and almost 21,200 acres infested by WBBB. Approximately 230,000 trees were killed by bark beetles throughout the area in 2003—and recorded as faders in 2004. In addition, nearly 37,000 acres showed some level of western spruce budworm (WSBW) defoliation. Dependent upon weather over the next few years, many of those trees could be killed by DFB. Again, only about 60% of the reporting area was flown in 2004.

Bitterroot Reporting Area

Stevensville RD:

Widely scattered and small groups of DFB-killed DF were mapped in the Bitterroot Mountains, west of Stevensville. In lower-elevation stands, along the eastern slopes of the Bitterroots, small and very scattered groups of PP, killed by MPB and/or WPB were also observed. Several groups of LPP, and WBP at higher elevations, killed by MPB, were mapped in a few drainages, west of Stevensville.

In the Sapphire Mountains, to the east of the Bitterroot Valley, many small groups of beetle-killed trees were generally scattered throughout the reporting area. Most numerous were groups of DFB-killed DF—especially prevalent from Slocum Creek on the north to Skalkaho Creek on the south. There were also a few groups of SAF, killed by WBBB, at some higher elevation sites in the Sapphires. A few small groups of PP, killed by MPB, were mapped throughout the reporting area.

District totals, down from those mapped in 2003 showed only about 725 acres of DFB-infested DF; approximately 40 acres infested by MPB—most in WBP stands; and more than 320 acres affected by WBBB. Reported bark beetle activity declined on most ownerships.

Darby RD:

A few very small groups of PP, killed by MPB and WPB, were observed in low-elevation stands on the east slopes of the Bitterroot Mountains. Beetle-killed groups of both LPP and WBP, killed by MPB, were prevalent south of Lake Como. Also in that area, and particularly in the Lost Horse Creek drainage, many DF have been affected by fire, DFB, or both. In the Sapphire Mountains, especially south of Skalkaho Creek, many groups of 5 to 120 DF each, killed by DFB were mapped. District-wide, DFB-infested acres increased somewhat in 2004.

In summary, almost 7,400 acres exhibited some level of DFB-caused mortality (compared to 5,760 in 2002); and 495 acres of MPB-killed trees—most of which were recorded in PP and stands. Other bark beetle-caused damage was observed, but was of less importance.

Sula RD:

Many groups of DF, killed by DFB and varying in size from a few to a few hundred trees each, were noted throughout several tributaries of East Fork Bitterroot River, from Sula east to the Forest boundary. Some of the larger groups were recorded near Jennings Camp Creek and Shirley Mountain and south from there to Lost Trail Pass. East of the Bitterroot River, stands in the Rye Creek drainage and near Deer Mountain contained some of the largest groups of faders. Total area infested by DFB increased to slightly more than 12,000 acres. Just over 10,200 acres had been recorded in 2003. Approximately 26, 200 DF were killed on those infested acres.

Also on the District several groups of PP, killed by MPB and totaling 390 acres, were recorded. At higher elevations, SAF stands generally contained small groups of WBBB-killed trees; totaling about 100 acres.

West Fork RD:

Very high amounts of DFB-killed DF, some still exhibiting fire effects, were mapped throughout the reporting area. Largest groups were noted in the upper portions of West Fork Bitterroot River drainage. There, virtually every tributary of the West Fork, which contained DF stands, had showed groups of beetle-killed trees. Numerous large groups were also observed west of Nez Perce Pass, in the Frank Church-River of No Return Wilderness; however, they seem to have been generally fewer than in 2003. District totals showed nearly 11,500 acres still infested. In addition, a few hundred acres were observed on which MPB had killed LPP or PP; and about 375 acres showed comparatively small amounts of WBBB-killed SAF.

Throughout the Bitterroot NF, in areas affected by fires of 2000, some damaged trees remain and may still be attracting DFB. In addition, a significant increase in beetle-infested stands not affected by fire, has been observed. Ground surveys conducted in the past two years indicated many fire-damaged trees were infested in 2001, but many non-damaged trees had been attacked in 2002 and 2003. Surveys conducted in fire-affected and adjacent stands in 2004, showed generally declining numbers of new attacks, although numerous new attacks per acre were observed in some areas. In some areas, host depletion suggests beetle populations are beginning to decline.

Bitterroot Reporting Area totals for 2004 showed 31,000 acres infested by DFB—compared to 2003 figures that showed more than 34,500 acres. Almost 62,000 DF were killed last year alone. Slightly less than 30 acres of LPP, and about 1,000 acres of PP stands, contained MPB-caused mortality. Much of the latter was recorded on the Sula State Forest. Just over 1,100 acres of SAF stands were infested by WBBB. Mortality attributed to other bark beetles was less noticeable.

Custer Reporting Area

Beartooth RD:

Large groups of WBBB-killed SAF were recorded in the Pryor Mountains near Tony Island Spring, west of there to Bent Spring, and south to Mystery Cave. Smaller groups were recorded throughout the reporting area.

Elsewhere, in the Pryor Mountains, MPB-caused mortality was noted in PP stands at several widely scattered locations, with the heaviest concentrations being observed south and east of Tony Island Spring. Significant amounts of MPB-caused mortality in LP stands were mapped generally west of Red Pryor Mountain. Infested stands were also noted on lands administered by BLM in that area.

South of Red Lodge, from Mount Maurice, south and east to the Forest boundary, several large groups of WBP, killed by MPB, were mapped. WBP mortality in the vicinity of Red Lodge totaled 2,200 trees on 1,700 acres. In the upper reaches of tributaries of West Fork Rock Creek, large groups of WBBB-killed SAF were observed. More than 4,400 acres were infested to some extent, District-wide. An estimated 9,200 SAF were killed.

Sioux RD:

The Sioux RD was not flown in 2004. In 2003, MPB- and IPS-infested PP stands were observed in Chalk Buttes, Ekalaka Hills, and the Long Pines. Additional beetle-caused mortality was observed in the East and West Short Pine Hills, North and South Cave Hills, and Slim Buttes. These populations, first recorded in 2001, were still increasing in 2003. A total of 2,600 acres, averaging mortality of about one tree per acre, was recorded in 2003.

Ashland RD:

Many small and widely scattered groups of PP, killed by combinations of MPB and IPS were recorded in many of the tributaries of Otter Creek, Beaver Creek, and the Tongue River, east of Ashland. While beetle-killed groups were not large (generally 10 trees or less), mortality was very generally scattered over most PP stands from about East Fork or Otter Creek on the north to the Forest boundary on the south. Much bark beetle activity appeared to be associated with stand damage directly attributable to the Stag Fire of 2000 and continuing droughty conditions. Throughout the District, beetles killed about 2,800 PP on a combined 2,600 acres. Only 617 infested acres were reported in 2003.

Custer Reporting Area-wide, reported bark beetle-caused mortality totaled 265 DF on 74 acres; 380 limber pine on 300 acres; 8,200 PP on 5,030 acres and 2,280 WBP on 1,760 acres, killed by MPB; an estimated 1,500 PP killed by IPS on 930 acres; and 10,750 WBBB-killed SAF on 4,900 acres. Most of those were increases over 2003.

Deerlodge Reporting Area

Butte RD:

Very large groups of LPP, killed by MPB, were once again mapped to the north, south, east, and west of Butte in 2004. The largest groups, with the most intense amounts of beetle-caused mortality, once found to the southeast of Butte in the Basin Creek and Thompson Park areas, have now moved farther to the west and south along the Continental Divide and west towards Interstate 15. Throughout the infested area, fader groups extended to several thousand acres each, and ranged from an estimated 0.5 to 40 beetle-killed trees per acre. Ground surveys conducted there showed the infestation in that area is still quite active although decreasing in some areas due to host depletion. In the Lime Kiln area, new attacks averaged 47 per acre, with another 13 per acre killed in 2003. In Basin Creek, new attacks averaged 16 per acre, but 44 per acre were killed in

2003 and 65 per acre in the couple of years before that. Similar data for Thompson Park showed 10 new attacks, 72 previous-year attacks, and 3 older dead per acre.

To the east, along East Ridge, the very noticeable outbreak continued, as did ones near Delmoe Lake, north of Homestake Pass. To the north of Butte, from Harrison Gulch on the east to Telegraph Gulch on the west, outbreaks continued to build. In all areas surveyed in 2004, MPB-infested areas increased over 2003 levels.

To the west and southwest, north of Fleecer Mountain, and along east-facing slopes of Fleecer Ridge to just south of Anaconda, increasing amounts of MPB-killed LPP were mapped. District-wide, an estimated 814,500 LPP were killed on approximately 54,900 acres in the last year. Those estimates represent significant increases over the more than 140,800 LPP killed on nearly 18,500 acres, recorded in 2003.

DFB-killed DF was noted in slightly increasing amounts throughout the DF type on the District. District-wide, DFB-caused mortality totaled 800 trees on 330 acres. Increasing amounts of WSBW-caused defoliation, coupled with continued dry conditions could increase DFB outbreaks within the next year or two.

Jefferson RD:

MPB-infested LPP stands on the District increased markedly in 2004. Infested stands were mapped east of Delmoe Lake, extending east of Whitetail Reservoir into the upper portions of Whitetail Creek, further east into the Bull Mountains, and southward along the Silver Bow/Jefferson County line. Infested stands were also observed in the Tobacco Root Mountains. Infestations on the District were not as extensive as those on Butte RD, but increased significantly in 2004. Infested area on the District recorded as 6,700 acres in 2003, increased to almost 40,000 acres in 2004. More than 205,000 LPP were killed.

South of Boulder, minor amounts of DFB-killed DF were noted; however, most beetle-caused mortality there was also MPB-killed LPP, found in tributaries of Boulder and Little Boulder Rivers. In the northern portion of the Tobacco Root Mountains, several groups of SAF, killed by WBBB and totaling about 1,500 acres, were mapped in tributaries of South Boulder River and Curly Creek drainages. In that same general area, but north of Windy Pass, MPB-killed LPP and were mapped at higher elevations and northward on lower sites, MPB had killed small and scattered groups of PP.

North of Boulder, on lands administered by both BLM and FS, MPB had killed numerous groups of PP and a few groups of LPP. Beetle populations there are also increasing.

Deer Lodge RD:

MPB-caused mortality in LPP stands increased considerably east of Deer Lodge, in the Baggs Creek and Cottonwood Creek drainages. There, several large groups were recorded. Small and widely scattered groups of MPB-killed LPP were observed in many other LPP stands throughout the reporting area. Those appeared to be increasing. Outbreaks on the District totaled about 3,600 acres in 2004. Only 1,200 acres had been recorded in 2003. An estimated 14,000 LPP were killed.

Smaller groups of MPB-killed LPP and DFB-killed DF were also noted in Lost Creek and Racetrack Creek drainages, west of Deer Lodge. Elsewhere in the reporting area, many small and scattered groups of DFB-killed DF were found north and east of Deer Lodge Mountain. District-wide, nearly 850 DF were killed on 300 acres—about the same level as observed in 2003.

Pintler RD:

Fewer groups of LPP killed by MPB were mapped in Boulder Creek and Smart Creek drainages, north of Philipsburg, than had been observed in 2003. However, still increasing MPB populations were found in many mature LPP stands on the District, and were especially noticeable Upper Willow Creek drainage. Other groups were mapped within the Stony Creek and Rock Creek drainages. District totals declined from 2003 levels when 1,650 acres of MPB-caused mortality were observed. In 2004, only about 125 acres of MPB-infested LPP stands were noted. MPB activity was also found in about 20 acres of PP and another 35 acres of WBP. A total of about 600 trees were killed by MPB in 2003.

In upper Stony Creek drainage, northward into Harvey Creek drainage and very generally throughout the Rock Creek drainage from Maxville south to the District boundary, many groups of DFB-killed DF were observed. Some of those groups exceeded several hundred trees. Although widely scattered, the infested area decreased in 2004 to slightly more than 4,800 acres on which about 16,000 DF were killed. Nearly 5,100 acres had been infested in 2003. In several high-elevation SAF stands, notably upper Stony Creek, and higher tributaries of Rock Creek, WBBB-caused mortality was noticeable, although somewhat less than recorded in 2003. Mortality in those stands totaled slightly more than 3,500 trees on 2,300 acres. In 2003, 4,225 acres showed some level of WBBB-killed SAF. In a few lower-elevation PP stands, north towards the Clark Fork River, MPB had killed several groups of trees.

For the Deerlodge Reporting Area, MPB-infested stands were found on more than 108,000 acres. Only 31,000 MPB-infested acres had been reported in 2003. Most infested LPP stands were on FS-administered lands. DFB infested another 8,200 acres and WBBB about 4,000 acres.

Flathead Reporting Area

Swan Lake RD:

Still high, although declining amounts of GF, killed by FE, were once again mapped throughout mixed-conifer stands on the District in 2004. While FE was the direct cause of this ongoing mortality, beetles were still taking advantage of drought-affected trees even though moisture conditions were much improved in 2004. Some of the previously heavily infested areas—such as the vicinity of Echo Lake—were not flown in 2004. However, numerous small groups of beetle-killed trees, as well as several large ones were mapped throughout the Swan Valley and west into the Island Unit. Throughout surveyed

portions of the reporting area, wherever GF was found, FE-killed trees were observed as well. A total of 2,300 beetle-killed trees were noted on close to 2,000 acres.

Southward through the Swan Valley, most stands that contained GF were affected to a greater or lesser extent by FE activity. DF stands in that same general area were also impacted by DFB, to a lesser but still significant extent. Infested groups were typically not large, but were generally scattered throughout the DF type. The largest concentrations of DFB-killed trees were mapped in North and South Forks of Swamp Creek, Cilly Creek, and Goat Creek drainages, south of Swan Lake. Throughout the District, DFB killed 5,600 trees on about 1,100 acres.

Significant amounts of MPB-killed LPP were also widely scattered throughout LPP stands, on both the east and west sides of Swan Valley. Largest fader groups were found west of Metcalf Lake, southeast of Cedar Lake, near Elk Creek Point, and south of Holland Lake. There were also important amounts of WBP mortality, attributed to MPB, in some locations—the most notable being a large fader group mapped north of Rainbow Lake. Many high-elevation SAF stands in that area also contained trees killed by WBBB—generally scattered throughout the type. A particularly large group was seen near the headwaters of North Fork Porcupine Creek.

On the Island Unit, west of Flathead Lake, MPB-killed LPP and FE-infested GF increased in 2004. Several large groups of beetle-killed LPP, south of Blacktail Mountain, contained several hundred trees each. In that same area, several large groups of GF were killed by FE. The largest, containing an estimated 1,000 trees, was mapped west of Lake Mary Ronan. Many small groups of LPP, killed by MPB, and DF killed by DFB, were recorded throughout the eastern part of the Unit. Lower elevation PP stands, especially in the western portion of the Unit were impacted by MPB as well. A very large group of WBBB-killed SAF, covering more than 2,030 acres, was mapped above Redmond and Briggs Creeks in the extreme western part of the area.

District-wide, almost 2,000 acres showed some level of FE-caused mortality on both FS and private land. That was down from about 4,650 acres last year; however, not all of the District was flown in 2004. An additional 1,100 acres were impacted by DFB, and MPB killed various of its host on almost 11,000 acres on lands of all ownerships.

Spotted Bear RD:

Only a small portion of the northeastern part of the District was flown in 2004. It is safe to assume, however, MPB-caused mortality continued to expand in LPP stands along the South Fork Flathead River, south and east of Spotted Bear. In 2003, one polygon between Addition Creek and Jungle Creek, of about 2500 acres, contained an estimated 50,000 beetle-killed trees in 2002 and decreased only slightly in 2003. Other groups in the reporting area totaled thousands of dead trees each. Most LPP stands along tributaries of the South Fork, south of the Ranger Station, have been affected to some extent. Ground-collected data in that area showed an average of nearly 35 trees per acre killed in 2002. That was a general increase over the level of 2001. In total, almost 11,000 acres showed some level of MPB infestations in 2003. In the portion flown this year, more than 15,000 trees on just over 8,000 acres were reported.

Other areas of increasing MPB activity were previously mapped along Spotted Bear River—especially in the vicinity of Big Bill Mountain. In DF stands in the Spotted Bear River drainage, DFB-killed trees were common, but in mostly small and widely scattered groups in 2003. They had decreased somewhat from levels recorded in 2002. In 2003, DFB activity was especially noticeable in the vicinity of Beacon Mountain and Crossover Mountain. Elsewhere in the District, MPB- and DFB-caused mortality was scattered. Several groups of WBBB-killed SAF were noted in high-elevation sites throughout the District. Observed DFB-affected stands on the District totaled less than 200 acres in 2004, compared to 350 acres in 2003.

Hungry Horse/Glacier View RD:

Only that portion of the District along the Middle Fork Flathead River was surveyed in 2004. In 2003, MPB and DFB activity had decreased slightly throughout the District in the portion flown. MPB-caused mortality has been common in both LPP and WWP stands on both sides of Hungry Horse Reservoir, from Hungry Horse and Martin City, south to the District boundary. Building populations of MPB mapped in the upper portions of Middle Fork Flathead River, especially along and near Patrol Ridge, continued to expand. Smaller groups of MPB-killed trees, as well as numerous groups of FE-killed GF were mapped along the Middle Fork from Nimrod, north nearly to West Glacier. For the part of the District flown, MPB killed a reported 35,000 LPP, and about 400 WBP on a combined 15,400 acres. That was a tremendous increase over the 250 acres recorded in 2003.

DFB-caused mortality was observed in lesser amounts on the Coram Experimental Forest, but areas south of there were not flown. Numerous groups of DFB-killed trees had been observed in other sites south and east of Hungry Horse and Martin City, and along the Reservoir, south to Dudley Creek in 2003. Nearly 1,000 acres had been affected last year. Only about 150 acres were recorded in 2004. At higher elevations, considerable amounts of WBBB-caused mortality had been recorded in SAF stands—of particular note near Three Eagles Lakes and along Pioneer Ridge. In those areas, more than 970 acres were infested. In the portion of the District flown this year, almost 5,000 SAF, killed by WBBB, were recorded on just less than 2,900 acres. Most were mapped east of Square Mountain.

On Glacier View RD, in high-elevation SAF stands throughout the reporting area, groups of WBBB-killed trees increased substantially—especially in the Whale Creek, Hay Creek, and Coal Creek drainages. Numerous groups, of several hundred acres in size, contained 1-4 beetle-killed trees per acre. More than 4,700 acres were infested. To the south, in most tributaries of North Fork Flathead River, DFB-, MPB-, and FE-caused mortality was widely scattered. In some areas on the Stillwater SF and stands north of Columbia Falls, very large groups of FE-killed GF were recorded. Larger groups of MPB-infested LPP were also mapped along Dead Horse Ridge and Winona Ridge. District-wide, MPB has infested more than 1,200 acres and DFB almost 600 more.

Tally Lake RD:

Many large groups of FE-killed GF and WBBB-killed SAF were observed on Stillwater SF, north of Whitefish Lake, within this reporting area. Throughout mixed conifer stands on the District itself, many groups of beetle-killed trees, of several species, were observed. Around Tally Lake, numerous groups of DFB-killed DF and GF killed by FE were once again recorded. Some groups contained thousands of trees each. In that same general area, MPB populations were found in LPP stands, but at a somewhat decreased level. From there, south to Highway 2 west of Kalispell, and especially around Ashley Lake, DFB-killed DF, GF killed by FE, and a few SAF that had been killed by WBBB were common.

Throughout the Logan Creek drainage, many lower-elevation DF stands have been seriously impacted by DFB; while upper-elevation ones showed significant amounts of WBBB-caused mortality. Now, in that general area, MPB-killed LPP has become more noticeable. Mortality attributed to WBBB was mapped in large groups near Sheppard Mountain, Elk Mountain, Bowen Lake and in upper portions of Alder and Robertson Creek drainages. FE-caused mortality was also noted in many stands dominated by GF. In general, bark beetle-caused mortality recorded during aerial surveys (trees killed by beetles in 2003) increased once again throughout the reporting area.

On District and adjacent lands, nearly 2,900 acres (compared to 1,300 acres in 2003) showed some level of DFB-caused mortality; about 900 acres (200 acres in 2003) showed MPB-killed trees; more than 6,200 acres (only 1,900 acres last year) of FE-related activity; and more than 7,700 acres (4,400 acres in 2003) of WBBB-infested SAF.

Throughout the Flathead Reporting Area, for the areas flown and on lands of all ownerships, more than 39,200 acres have been infested by MPB (compared to 24,500 acres in 2003); 20,600 acres by FE (16,100 acres in 2003); 5,700 acres by DFB (5,600 acres last year); and 18,700 acres by WBBB (13,800 acres reported in 2003). Forest-wide, slightly less than 164,000 bark beetle-killed trees were recorded in 2004.

Gallatin Reporting Area

Big Timber RD:

DFB-caused mortality in the lower Boulder River drainage, south of Big Timber remained at about the same level in 2004 as had been recorded in 2003. Beetle-killed groups from Contact Creek on the north, to Elk Creek on the south, generally ranged in size from about 5 to 50 trees each. There were, however, larger groups recorded throughout the drainage. Some of the largest were noted near Shorty Creek, Raspberry Creek, Snowslide Creek and Hicks Park Campground. A few small and widely scattered groups of DFB-killed trees were also noted in the West Boulder River drainage. On private and FS lands, approximately 1,850 acres were reported as infested—more than twice the 850 acres recorded in 2002.

In several high-elevation sites in the Boulder River drainage, a few groups of WBBB-killed SAF were mapped. One group, above Copper Creek contained an estimated 100 beetle-killed trees. At other sites, particularly Copper Creek, South Fork Sheep Creek, near Boulder Pass and Independence Peak, several large groups of MPB-killed WBP were recorded.

In Big Timber Creek drainage, on the eastern slopes of the Crazy Mountains, a few small groups of DFB-killed trees were noted. Stand conditions there suggest those populations could continue to build within the next few years.

District-wide, about 1,720 acres contain some level of DFB-caused mortality; MPB has killed about 1,600 trees—mostly WBP—on almost 640 acres; and WBBB killed nearly 1,900 SAF on slightly more than 900 acres. Most of those figures indicate a reduction in infested area from 2003 levels. Much of the wilderness part of the District was not flown.

Livingston RD:

Although outbreaks were found at little more than endemic levels, scattered, small groups of DFB-killed DF were once again mapped in the Mill Creek drainage south of Livingston. Those populations have had much less impact in that drainage because of active stand management conducted there over the last ten years. Similar small groups were also recorded in North Fork Sixmile Creek. DFB infestations on the District covered less than 700 acres, total.

On the western side of the Yellowstone Valley, in high-elevation stands throughout the east-facing slopes of the Gallatin Mountain Range, significant increases in amounts of beetle-killed SAF and WBP were noted. Numerous groups covered several hundred acres each. In total, more than 7,700 acres of MPB-infested WBP and nearly 7,800 acres of WBBB-killed SAF were recorded in that area.

In the northern portion of the District, within the Crazy Mountains, small and widely scattered groups of DFB-infested DF and SAF impacted by WBBB were noted. The most significant tree killer in the area, however, was a combination of MPB and white pine blister rust in WBP stands. Blister rust-affected stands were reported on more than 3,100 acres. It is likely that many of those stands also harbored populations of MPB.

Gardiner RD:

A few groups of DFB-killed DF, most containing from 10 to 60 trees each, were mapped in the Bear Creek drainage, northeast of Gardiner. In that same area, high-elevation stands of SAF and WBP had been infested by WBBB and MPB, respectively. Some of those groups exceeded a few hundred acres each.

Small outbreaks of DFB were also noted above Cedar Creek and near Dome Mountain, east of the Yellowstone River, north of Gardiner. Other groups were mapped in the Mulherin Creek drainage. White pine blister rust was reported as the damaging agent in WBP stands at several locations on the District; however, MPB and secondary bark

beetles may also be affecting those trees. Several large groups of faded WBP were observed near Sheep Mountain. That mortality was attributed to MPB. Notable increases in SAF and WBP mortality was observed in the upper stretches of Tom Miner and Rock Creek.

Throughout the District, about 250 acres of DFB-infested stands were noted, down from the 644 reported last year. Approximately 2,500 acres of SAF were found to contain noticeable amounts of WBBB-caused mortality, and on another 4,300 acres MPB killed close to 7,000 WBP. More than 1,200 acres were reported as affected by blister rust. Quite likely, many of those also contained MPB-caused mortality.

Bozeman RD:

Most of the District was flown in 2004, so we have a better representation of bark beetle activity. In the Bridger Mountain Range, north of Bozeman, widely scattered and mostly small groups of beetle-killed SAF and DF were recorded. Highest concentrations of faded trees were noted in the upper Stone Creek drainage. Other groups were more scattered. Throughout DF stands in the Bridger Mountains, WSBW-caused defoliation in DF stands increased once again in 2004 (totaling more than 51,000 acres). While DFB-caused mortality was recorded on only 430 acres in 2004, significant and prolonged defoliation, coupled with continuing drought, could lead to increasing DFB activity throughout the Bridger Range.

Elsewhere, the most prevalent bark beetle conditions observed on the District were very large and generally scattered groups of WBBB-killed SAF and MPB-killed WBP throughout the Madison and Gallatin Mountain ranges. There, thousands of acres of each were recorded. In total, MPB infested nearly 11,000 acres of WBP stands (and blister rust another 2,600 acres) and WBBB killed almost 19,000 SAF on 14,200 acres

Hebgen Lake RD:

DFB-killed DF were still quite noticeable, although at reduced levels both north and south of Hebgen Lake. While DFB populations seemed to be in a generally declining mode, late-season attacks observed in some areas bear watching over the next year. Fader groups were generally small and widely scattered; however, one above Watkins Creek was estimated at 200 trees and another, near Trapper Creek, at 150 trees. Total infested area covered about 900 acres.

North of Hebgen Lake, a few small groups of DFB-killed DF were recorded in the Beaver Creek drainage. However, the most significant bark beetle activity in that area was found to be MPB in WBP stands. North from Lightning Lake, nearly to Lone Mountain, fader groups were large and found in most WBP stands. Other MPB-killed WBP was recorded east of Beaver Creek, near Tepee Basin and Upper Tepee Basin. District-wide, and estimated 28,400 WBP were killed on approximately 24,500 acres. Even those estimates may be conservative. Data collected on ten variable-radius plots near Lightning Lake showed, for the area surveyed, more than 160 trees per acre have been killed in the last 2-3 years.

SAF stands throughout the Madison Range were once again heavily infested by WBBB in 2004. Very large groups were mapped within the Wapiti Creek, Eldridge Creek and Buck Creek drainages, and northward towards Flattop Mountain. Elsewhere, though widely scattered throughout the SAF type, groups were generally smaller. Throughout the infested area, nearly 23,000 acres of SAF stands were observed with some degree of beetle-caused mortality.

For the entire portion of the Gallatin Reporting Area flown, nearly 4,520 acres of DFB-infested DF stands were observed, compared to 5,650 in 2003. Another 420 acres of MPB-infested LPP (a virtually static condition); almost 49,000 acres of MPB-killed WBP—an increase of 40,000 acres over last year; and about 48,100 acres on which WBBB-killed SAF was found were mapped. Only 15,000 acres of WBBB-caused mortality had been recorded in 2003 (however, not all the infested area was flown last year).

Helena Reporting Area

Townsend RD:

Extensive stands of WBP and LP, reportedly affected by blister rust, have been observed in the Big Belt Mountains, east of Canyon Ferry Lake, within the past few years. Ground surveys have now confirmed that much of that mortality has been caused by MPB. Likely, secondary bark beetles have also infested many of those trees. Aerial surveys in 2004 showed large groups of faded WBP in the vicinity of Mount Edith and south from there to Deep Creek. Other large groups of MPB-killed WBP were mapped from Mount Edith north towards Boulder Mountain.

Elsewhere on the District, DFB-caused mortality increased markedly in most DF type from Deep Creek south to Sixteenmile Creek. Throughout the remainder of the District, very many but generally small groups of beetle-killed trees were noted in various forest types: WBBB-killed SAF and MPB-killed LPP and PP were prevalent, though not found in very large groups anywhere. DFB-infested DF—some still associated with past fires—were also quite commonly recorded in small groups. District-wide, DFB-infested trees were observed on almost 6,800 acres; MPB-killed LPP on 1,835 acres, and beetle-impacted PP on 730 acres. MPB was attributed with killing 16,000 WBP on 6,760 acres, although many of those trees were also infested with blister rust. WBBB-caused mortality was recorded on about 810 acres.

Helena RD:

Significant and increasing amounts of MPB-killed PP were mapped south and east of Helena. The most numerous and largest groups were recorded in the Crow Creek drainage, west of Eagle Creek Ranger Station, and in the McClellan Creek drainage near Strawberry Butte; south and east of Helena. Other notable groups were noted in the Sixmile Creek drainage, west of Helena. Lightly scattered, small groups of MPB-killed LPP and DF killed by DFB were noted to the northwest of Helena, towards Mullan Pass.

Numerous, mostly small 5- to 20-tree groups of PP, killed by MPB, were observed northeast of Helena, in the northern portion of the Big Belt Mountains. They were most numerous in the Gates of the Mountains Wilderness, near Hogback Mountain, northward towards Mount Rowe, and near the boundary between Helena and Lewis & Clark NFs. Smaller, more widely scattered groups of PP, killed by MPB, were noted throughout PP type. Throughout the District, beetle-killed PP were noted on 2,370 acres. Recorded were also small and scattered groups of MPB-killed LPP and WBP. MPB-infested LPP totaled 1,900 acres and WBP about 750 acres. Several groups of DF, killed by DFB, some as large as 50 trees were observed in large-diameter, older DF. Some were still found in the vicinity of stands affected by wildfires in 2000. Total DFB-infested area was about 2,200 acres. WBBB killed SAF on another 1,240 acres.

Lincoln RD:

Only about half of the District was flown in 2004. Where surveys were conducted, DFB-caused mortality in DF stands was noted, but at a decreased level from past years. DFB-killed trees were observed in the Nevada-Ogden area, southwest of Lincoln and eastward, in the vicinity of Wolf Creek. Though not flown, DFB activity likely remained in the Arastra Creek drainage, northwest of Lincoln. It was still active there in 2003. Elsewhere, groups were likely small and widely scattered throughout the District. Total infested acreage, for the area flown, was less than 20 acres.

MPB-caused mortality in some low-elevation PP stands in the Wolf Creek drainage was also observed. Most were small groups, well scattered throughout the type; however, they were more concentrated near Denton Mountain, Sugarloaf Mountain, and in nearby drainages. WBBB-killed SAF and LPP, killed by MPB, were probably still found in the upper Arastra Creek drainage, and east from there, towards Copper Creek. Those populations and resultant mortality appeared to be increasing in 2003. MPB activity for the area flown was recorded on about 450 acres and WBBB-infested trees were noted on but 200 acres; however, again, much of the District was not surveyed.

Throughout the Helena Reporting Area, and especially northwest of Helena, WSBW populations are increasing significantly. Defoliation, coupled with prolonged drought, could result in increased amounts of DFB activity within the next few years. Area-wide survey estimates for bark beetle-caused mortality for areas flown totaled: DFB 10,800 acres; MPB 19,400 acres (almost half in WBP stands); and WBBB about 3,200 acres. DFB and MPB activity increased significantly in 2004.

Kootenai Reporting Area

Rexford RD:

Numerous but small groups of DFB-killed DF were found in a widely scattered pattern in mixed-conifer stands on both the east and west sides of Lake Koocanusa. Notable concentrations to the west were found in the Big Creek and Young Creek drainages and in the extreme upper reaches of the Yaak drainage. To the east, most were found in the Pinkham Creek drainage, especially near Virginia Hill. Total affected area was about

1,340 acres; down from 1,650 acres recorded in 2003. About 3,500 DF were killed in 2003.

Also noticeable were groups of SAF, killed by WBBB, near Elsworth Mountain, Sutton Mountain and Boulder Mountain. SAF mortality totaled about 1,050 trees on nearly 1,275 acres. In 2003, 650 acres had been recorded. Other beetle-caused mortality was more widely scattered, and small groups.

Fortine RD:

DFB-caused mortality, in DF stands, decreased somewhat over that reported in 2003. The most severely affected stands were located in Williams Creek, Graves Creek, and Deep Creek drainages. A few large groups were observed in the Galton Range, south of Canada/US border where outbreaks have continued for several years. Several small groups were widely scattered south of Dickey Lake, with one large group noted in Magnesia Creek drainage and two others south of Stewart Creek. Many other, but typically smaller groups, were mapped throughout host type. DFB-caused mortality totaled nearly 3,900 trees on 2,300 acres of FS and private land. About 2,500 acres had been found in 2003.

SAF mortality, caused by WBBB, was also prevalent at many locations on the District, and increased somewhat from 2003 levels. Some of the larger groups on the District were mapped near Stahl Peak and northeast of Krag Peak. Total for the District was slightly more than 1,720; up from 1,100 acres in 2003.

Three Rivers RD:

DFB continued to be the most significant mortality-causing agent throughout DF stands on the District. Most DF and other mixed-conifer stands were very generally infested by DFB from Bull Lake, northward to Callahan Creek, south of the Kootenai River. North of the River, small groups of DFB-killed trees were widely scattered in the southern portion of the Yaak River drainage and especially in tributaries of O'Brien Creek. It appeared many DF stands were affected to a greater or lesser extent, although total infested area was less than in 2003. Total affected area in 2004 was about 1,270 acres. It had been 2,500 acres last year. In that area north of the Kootenai River, from China Creek west to O'Brien Creek, about 570 acres showed some level of FE-caused mortality.

In the northern part of the Yaak drainage, combinations of MPB and blister rust continued to seriously affect WWP stands. Large-diameter and older trees are more impacted by MPB, whereas blister rust has affected stands of all ages. MPB-killed WWP was especially noticeable from Meadow Creek on the south to Pete Creek on the north, where about 500 trees were killed on 310 acres. A few groups of MPB-killed LPP and WBP were noted throughout the Yaak drainage. Some of the most severely impacted areas were WBP stands near Newton and Teepee Mountains. Those outbreaks totaled about 5,300 dead trees on almost 1,500 acres. DFB-caused mortality was very widely scattered throughout the upper Yaak as was WBBB-killed SAF at higher elevations.

DFB-killed groups were generally small, whereas several groups of dead SAF covered more than a few hundred acres each.

District wide, about 4,350 DF were killed on 1,270 acres; 1,900 SAF on 2,360 acres; and 920 GF on 570 acres.

Libby RD:

Continued effects of long-lasting dry conditions resulted in widespread and significant amounts of DFB-, MPB-, and FE-caused mortality being mapped in mixed-conifer stands throughout the District. Beetle-killed groups, with a significant increase in FE-infested stands, were noticeable south of Libby in Libby Creek, Swamp Creek, and Fisher River drainages. While groups of beetle-killed trees were well distributed throughout their respective forest types, DFB-caused mortality was more prevalent from Cow Creek north to the Kootenai River, then west to the District boundary. Stands on both north and south sides of the Kootenai River have been affected. Stands in the Purcell Mountains north of Libby were still infested to a minor degree. In those same general areas, significant amounts of GF, killed by FE, were recorded in 2004. Those groups were particularly large and prevalent in Quartz Creek and Bobtail Creek drainages west of Libby; and near Big Hoodoo Mountain, Horse Mountain, Tepee Lake, and other tributaries of Fisher River, south of Libby.

Several additional groups of DF, killed by DFB, were mapped in the Fivemile Creek, Tenmile Creek, and Warland Creek drainages, east of Lake Koocanusa. Significant numbers of DFB-killed trees were also observed throughout the Wolf Creek drainage. DFB infested stands on the District increased to about 3,300 acres in 2004—up from 1,600 acres last year.

While MPB-infested LPP stands had been declining in recent years, it was unusual to not record any on the District in 2004. It is conceivable some was still found on the District, but were not detected. Previously, about 900 acres had been reported—most south of Libby in the Fisher River drainage. In the Wolf Creek and Little Wolf Creek drainages, several small groups of IPS-killed PP were mapped. Some of that mortality may have been caused by MPB. MPB, along with blister rust, was attributed with killing WWP in the Purcell Mountains north of Libby.

Beetle-infested stands on the District totaled: DFB, 3,300 stands—7,000 dead DF; FE, 7,800 acres—7,000 beetle-killed GF; MPB (all hosts, but mostly WWP), 2,000 acres—1,900 trees; and minor amounts of IPS-, WBBB- and WPB-caused mortality.

Cabinet RD:

Numerous, but relatively small groups of MPB-killed LPP and WWP, and DFB-killed DF, were once again mapped at various locations throughout the Vermillion River drainage. MPB-caused damage was more prevalent in the lower portion of the drainage, while DFB was more common in the upper. Several larger groups of LPP, killed by MPB, were found near Wafer Hill and in the Miller Creek drainage; DFB-caused

mortality was more common, but very widely scattered from Vermillion River, west to Bull River.

In some mixed-species stands, MPB-killed WWP has increased from previous levels. A significant increase in amount of WWP, infested by white pine blister rust, was noted in 2004. Many of those affected stands—a majority found west of Noxon Reservoir—were more than likely also impacted by MPB. In total, MPB killed host trees on about 1,400 acres, about half LPP and half WWP. Blister rust damage was recorded on another 7,500 acres.

DFB-infested DF stands were still common south of the Clark Fork River, from Little Beaver Creek, northwestward to Elk Creek, but at declining levels. Most beetle-killed groups are now small and very widely scattered. District-wide about 1,300 acres were infested. Widely scattered small groups of MPB-killed LPP, PP, and WWP; plus noticeable amounts of SAF, killed by WBBB, and FE-killed GF also were found at several locations in that portion of the District south of the Clark Fork.

Total mortality attributed to bark beetles in the Kootenai Reporting Area in 2004 was: 21,000 DF killed by DFB on 9,100 acres (11,000 acres in 2003); 8,500 GF killed by FE on 9,120 acres (3,000 acres in 2003); 10,400 trees killed by MPB on 1,530 acres (6,200 acres in 2003); and 5,860 SAF killed by WBBB on 5,720 acres (2,600 acres in 2003). Minor amounts of mortality attributed to IPS and WPB was also recorded in 2004.

Lewis & Clark Reporting Area

Rocky Mountain RD:

District was not flown in 2004 nor has it been for the past several years. We have no current record of bark beetle activity on the District.

Judith RD:

Small and widely scattered groups of beetle-killed trees were mapped in the Highwood Mountains in 2004. Most were DFB-killed DF; however, isolated groups of LPP and PP, killed by MPB, were also noted. Several groups of MPB-killed LPP were mapped in North Fork and Middle Fork Little Belt Creek drainages. No other significant concentrations were recorded, rather a generally light infestation throughout the reporting area, often associated with noticeable root disease centers.

In the Judith RD portion of the Big Snowy Mountains, MPB-killed PP was found in a widely scattered pattern of small groups. Highest concentrations of fader groups were mapped in North Fork and South Fork of Flatwillow Creek, Rock Creek, and East Buffalo Creek. Some of the larger groups were noted in the vicinity of Lyons Butte.

On lands administered by BLM north of Lewistown, in the Judith, North Mocassin, and South Mocassin Mountains, many small groups of faders, killed by MPB, were mapped

throughout susceptible PP stands. There appeared to be a general decrease in infested stands on lands of all ownerships in that area in 2004.

In the Little Belt Mountains, numerous but very widely spread groups of beetle-killed trees were recorded throughout the reporting area. While bark beetle-killed groups were prevalent in host stands, the most notable mortality was observed in WBP stands where both MPB and blister rust were found killing trees. Very large groups were mapped near Yogo Peak, Kings Hill, and Hoover Mountain. Other mortality was attributed to MPB in LPP and PP stands, DFB and WBBB.

District-wide, DFB was found on 350 acres; MPB on almost 3,500 acres—on all hosts, but most was PP; WBBB on nearly 2,000 acres; and blister rust on another 4,750 acres. Most of that latter was probably also infested by MPB.

Musselshell RD:

Very widely scattered and small groups of MPB-killed PP were mapped throughout the Big and Little Snowy Mountains. Largest groups were recorded near Horsethief Canyon and Red Hill; and in the Willow Creek drainage, near Ashbridge Spring. Elsewhere, groups were very widely distributed. Much was on non-FS land. Noticeable pockets of root disease were recorded near Green Pole Canyon. Bark beetle activity, especially DFB, is a likely associate in those stands. WBP has been heavily impacted by both blister rust and MPB, and MPB has infested several large groups of LPP, north of Lake Sutherland.

In the Crazy Mountains, numerous large groups of WBP, killed by MPB and blister rust; and SAF, killed by WBBB, were mapped in high-elevation stands. Some of the largest groups were recorded near Mount Elmo, Target Rock, and Loco Mountain.

Throughout the District, about 2,100 PP were killed by MPB on about 2,700 acres. DFB killed 2,700 trees on 1,080 acres. MPB and blister rust affected WBP and LP on more than 6,400 acres, and MPB alone on 1,000 acres of LPP. WBBB killed 2,200 trees on 2,200 acres.

Kings Hill RD:

Numerous large groups of MPB-infested PP were mapped throughout the Little Belt Mountains, and at generally higher levels than recorded in 2003. The largest groups were noted near Indian Gulch, Lion Gulch, and Double Gulch above Tenderfoot Creek; and in the Pilgrim Creek and Tillinghast Creek drainages, west and south of Monarch. While other groups were not as large, there was a noticeable increase in the extent of beetle-infested stands throughout the reporting area, up to nearly 6,500 acres in 2004—an increase of nearly 1,000 acres since last year.

DFB-killed DF were also found widely scattered throughout the Little Belt Mountains. Several groups were concentrated throughout the Tenderfoot Creek drainage. In an area near Wild Rock Ridge, there were noticeable groups of MPB-killed LPP. WBP has also been infested by MPB and impacted by blister rust at several locations in the Little Belt

Mountains. Likewise, WBBB-killed SAF was noted in higher elevations throughout the area.

Totals for the District were about 4,900 SAF killed on more than 5,500 acres; 17,600 PP and 4,000 LPP killed by MPB on 6,400 acres and 3,500 acres, respectively; MPB and blister rust have affected WBP on more than 8,600 acres, and DFB killed 1,650 trees on 815 acres.

Area-wide mortality attributed to bark beetles in the Lewis & Clark Reporting Area totaled almost 5,500 DF on 2,472 acres (1,300 acres in 2003); 41,000 pines on 29,100 acres (21,300 acres in 2003); and 12,400 SAF on 9,725 acres (6,700 acres in 2003). All those figures are up significantly from 2003.

Lolo Reporting Area

Missoula RD:

Widespread fires in 2003 prevented aerial surveys of the Missoula RD last year. So, comparisons of bark beetle conditions are ones with those reported in 2002. Generally, to the west, MPB infestations increased in both PP and LPP stands throughout the reporting area. While not infested to the extent other stands on the Forest have been, LPP stands throughout the western portion of the District were generally found to contain smaller and more widely scattered groups of MPB-killed trees. Some DF stands, particularly in the Lolo Creek drainage, still showed small and widely scattered DFB-caused mortality, although at a decreased level. Few groups were larger than about 30 trees, but they were fairly generally scattered throughout DF types. In that same area, at higher elevations, WBBB-killed SAF were more noticeable. The Rattlesnake Creek drainage was not flown in 2004; however, in the lower portions of the drainage, WPB-killed PP and some DFB activity are known to exist.

DF stands in Rock Creek drainage, while still quite generally infested by DFB, decreased in extent and intensity in 2004. Fader groups, though numerous, were smaller and more widely scattered than in past years. Groups of faders, few containing as many as 100 trees, were mapped from about Williams Gulch on the south to the confluence of Rock Creek and Clark Fork River on the north. Beetle-killed trees were also noted along the south side of the Clark Fork, both east and west of Rock Creek. Lesser amounts of MPB-killed LPP and PP were mapped this year, but are found at some locations in the Rock Creek drainage. At a few high-elevation locations, WBBB-infested SAF were observed.

West of Rock Creek, and south of Missoula, bark beetle-killed trees of several species were noted in a widely scattered pattern. MPB had killed both LPP and PP, WPB and IPS were attributed with having killed some PP, and DFB-affected DF were mapped in a few locations. Stands in the upper Miller Creek and Little Park Creek drainages were more heavily impacted. In stands along Lolo Creek, MPB- and DFB-killed trees were found in widely scattered and small groups south of Lolo Creek; but north of there, in the Grave Creek Range—west of Blue Mountain—MPB had killed much larger groups of LPP. Some of them covered several hundred acres.

District totals in 2004 included 11,200 acres of MPB-killed trees (mostly LPP) and another 4,700 acres of DFB-infested stands. Other species of beetles were found at much less significant levels.

Ninemile RD:

Ninemile RD was also not flown in 2003, so there were marked changes over those mapped in 2002. For the most part, MPB activity increased significantly, the affected area more than doubling in the last two years. While LPP stands in the immediate vicinity of Siegel Pass showed decreasing amounts of MPB-caused mortality, much of the remaining LPP stands on the District were more heavily impacted. Throughout the Ninemile drainage, along both the Reservation and Ninemile Divides, beetle-killed groups were mapped in large numbers—and most groups were individually quite expansive. Very large groups of beetle-killed trees were mapped along Reservation Divide from Three Lakes Peak southeastward along the Divide to Squaw Peak. Likewise, very large groups were observed along Ninemile Divide, from Hopkins Mine southeast to nearly to Ellis Mountain. Large groups of dead LPP were also recorded in the Mill Creek and O’Keefe Creek drainages, to the east.

Elsewhere, large amounts of MPB-killed LPP and PP were recorded throughout the Fish Creek and Petty Creek drainages. Largest groups there were found Cougar Creek south to Straight Creek. It appeared that most LPP stands, with any significant component of susceptible-size trees, anywhere on the District, were being affected by MPB. Total infested LPP stands on the District in 2004 covered nearly 54,300 acres on lands of all ownerships. Another 1,500 acres of PP exhibited some level of MPB-caused mortality. DFB-killed DF was found on only 600 acres.

Plains/Thompson Falls RD:

Unfortunately, inclement weather resulted in only a very small portion of the District being flown in 2004. A small part of the District, north of Siegel Pass was surveyed. There, north of Siegel Mountain and west of Paradise, several large groups of MPB-killed LPP were mapped. Elsewhere, we know that significant increases in the amount of MPB-killed LPP were found in many stands throughout this reporting area and the adjacent Superior RD. Although aerial survey information was not available, a few ground surveys in selected stands on the District showed populations are still increasing in many areas. In McGinnis Creek and Corona Divide, north of Plains, data showed an average 46 new attacks and 60 previous-year attacks; and 17 new attacks and 56 previous-year attacks in those areas, respectively. In a few stands, there has been a decrease in beetle intensity, due to host depletion. But beetle populations continued to move into previously un-infested stands last year.

In 2003, the largest polygons along the divide between the two Districts were recorded near Brooks Mountain, Knox Pass, and Mount Bushnell. Those areas were still heavily infested, but there had been a slight decrease in outbreak intensity. Southeast of Thompson Falls in LPP stands the within Cherry Creek drainage, very large groups of MPB-killed LPP were mapped near Eddy Mountain and Sacajawea Peak. Those infested

stands, too, have experienced decreasing intensity because many susceptible trees have been killed. More generally, LPP stands throughout the Coeur d'Alene Mountains from the confluence of the Flathead and Clark Fork Rivers, westward to the Montana/Idaho border were affected to some extent. Ground-collected data for a few stands in that area showed as many as 136 beetle-killed LPP per acre, within the past few years. Sixty-six of those were killed in 2004.

North of the Clark Fork River, within Thompson River drainage, LPP stands were also heavily impacted by MPB. The largest groups in that area were recorded near Cube Iron Mountain, Big Hole Peak, in the West Fork Fishtap Creek drainage, and along Corona Divide.

Still other LPP stands west of Siegel Pass towards Keystone Peak and north to Siegel Mountain, exhibited large groups of beetle-killed trees. More than 100,000 beetle-killed LPP have been recorded in that area alone.

Near Marmot Peak, and in other parts of upper Fish Trap Creek, stands of WWP have been seriously affected by a combination of blister rust and MPB. Infestations there have intensified. Elsewhere, MPB populations have killed significant amounts of LPP and PP in Thompson Creek and Little Thompson Creek drainages.

Widely scattered, in mostly small groups—but still important total amounts, DFB-caused mortality was observed throughout DF stands on the District. In noticeable, but considerably lesser amounts, MPB has killed WBP in some stands, and WBBB has contributed to the death of SAF.

Totals for the District and adjacent State and private lands in 2003 showed MPB-killed trees on almost 50,400 acres; about 600 acres infested by DFB; 900 acres with WBBB-caused mortality; and about 50 acres infested by WBP. Had we obtained data for 2004, those figures likely would have increased.

Seeley Lake RD:

MPB-caused mortality was prevalent in a few small groups of LPP south and west of Seeley Lake, particularly in the Placid Creek and Finley Creek drainages. To the east and north of Seeley Lake, in the vicinity of Richmond Peak and near Florence Lake, larger groups of LPP had been killed by MPB. WBP, damaged by blister rust, but also heavily impacted by MPB, was noted in several large groups near Morrell Mountain, above Lodgepole Creek, near East Spread Mountain, and close to Conger Point. To the west, other groups were seen near Mount Henry. Those infestations intensified in 2004. Total MPB affected stands for the District was about 2,000 acres of LPP, where MPB was the sole mortality agent, and another 8,900 acres of WBP with mortality attributed to both MPB and blister rust.

Elsewhere on the District, DFB-killed trees were less widespread in 2004. Stands in the Cottonwood Creek, Spread Creek and Dunham Creek drainages were particularly heavily infested. Throughout the DF type on the District, DFB-caused mortality increased in some areas while it decreased in others. About 1,060 acres, total, were reported in 2004.

WBBB-caused mortality was observed on about 400 acres in a few high-elevation SAF stands. Minor amounts of MPB-killed PP were also noted on the District, but a few 40- to 50-tree groups were seen near Woodward.

Superior RD:

Most of the District was not flown in 2004. Only a small portion, above Trout Creek, was surveyed. There, large groups of MPB-killed LPP were mapped from near Chimney Rock, southwestward to Prospect Creek. In 2003, large groups of LPP, killed by MPB, were mapped in Sunrise Creek and Quartz Creek drainages, southeast of Superior. Elsewhere, very large groups of MPB-killed LPP—some totaling hundreds of thousands of trees—were mapped near Van Ness Point, Mount Baldy, and Blacktail Mountain southeast of St. Regis; near Moon Peak and Up Up Mountain, west of St. Regis; and very generally scattered throughout the Twelvemile Creek drainage. The largest polygons in that general area were recorded near Brooks Mountain, Knox Pass, and Mount Bushnell—on the divide between Superior and Plains/Thompson Falls RDs. Very large groups were also mapped near Greenwood Hill and Camels Hump Lookout. District-wide more than 47,200 acres were infested in 2003. We believe most of those outbreaks continued to expand in 2004, but in some of the areas that have been infested for several years, there likely was a decrease in intensity.

Significant amounts of MPB-caused mortality were recorded in PP stands east of Superior, from Eddy Creek northwest to Sloway Gulch. Acres with noticeable amounts of PP mortality declined somewhat in 2003, but still totaled about 400 acres. At least some of that mortality is thought to be drought related. Ground surveys showed still-increasing populations in many areas. In some, host depletion has resulted in population declines; however, in a few areas surveyed, 2003 attacks averaged more than 120 per acre.

Throughout the Lolo Reporting Area—the most heavily impacted in the State (of which only about 35% was flown)—MPB-killed LPP was reported as totaling 771,300 trees on 84,000 acres; 5,800 PP killed on 3,000 acres; and less than 100 WBP on 300 acres (however, another 9,800 acres were reported as affected by blister rust). Although much less significant, DFB reportedly killed about 22,000 DF on 8,100 acres; WBP killed 80 PP on 70 acres; and WBBB accounted for 37,000 dead SAF on 3,300 acres. Because not all of the Reporting Area was flown, we are confident all those estimates are low.

Garnet Reporting Area (BLM)

For the most part, many small and widely scattered groups of bark beetle-killed trees were mapped throughout the Reporting Area; however, several large groups of MPB-killed LPP were noted near Lost Horse Mountain. Smaller, but still significant-sized groups were recorded near Bonner Mountain, in Donovan Creek, Cramer Creek, and Tenmile Creek drainages. Along the Blackfoot corridor, to the east, MPB- and WBP-killed PP were common. Further to the east, in Chimney Creek drainage, MPB-infested LPP stands were once again noticeable.

DFB-killed DF were very widely scattered throughout the Area, but more prevalent and in larger groups north and east of Beartown and in the upper Hoover Creek drainage. In a few higher-elevation SAF stands, WBBB damage was apparent.

In total, about 7,200 DF were killed on 2,600 acres; MPB killed approximately 9,800 LPP and 570 PP on a combined 5,500 acres; 50 WPB-killed PP were recorded on 75 acres; and 1,040 dead SAF on 280 acres were attributed to WBBB. All figures represented increases over those reported in 2003.

Indian Reservations

Blackfeet IR:

The western portion of the Blackfeet IR was flown along with Glacier National Park in 2004. There, a few small groups of DFB-killed DF and MPB/IPS-killed LPP were mapped near Lower Saint Mary Lake. The most significant bark beetle-caused damage, however, was several large groups of SAF, killed by WBBB, recorded near Cut Bank Ridge and in upper tributaries of North Fork Cut Bank Creek. On the part of the Reservation flown, an estimated 4,000 SAF were killed on about 2,600 acres.

Crow IR:

Widely scattered, but mostly small groups of MPB-caused mortality, were recorded in PP stands in drainages on the eastern slopes of the Wolf Mountains, east of Lodge Grass. Heaviest concentrations were mapped in Corral Creek and Indian Creek drainages, with smaller groups mapped south to the Reservation boundary. To the north, MPB-killed PP were noted in Thompson Creek and Little Thompson Creek drainages.

Widely scattered, generally small groups of PP, killed by MPB, were found in lower-elevation stands throughout the Pryor Mountains. Larger groups of LP killed by MPB were mapped in the West Pryor Mountains. The largest concentrations of beetle-killed trees were observed in SAF stands east of Pryor Creek drainage. Populations of WBBB and resultant mortality have increased within the last few years. Throughout the Reservation, 1,350 PP were killed by MPB on 1,200 acres; 380 LP were killed by MPB on 260 acres; and 540 SAF were killed by WBBB on 340 acres.

Flathead IR:

Once again, only the southern and central portions of the Reservation (about 50% of the forested area) were flown in 2004. However, much of the MPB activity on the Reservation is taking place within the area surveyed. Significant increases in the amount of LPP, killed by MPB, were noted there in 2004—despite many areas that have known infestations not being flown. Most of larger groups of MPB-infested stands were mapped throughout the southern portion of the Reservation, from about Upper Jocko Lake on the east to Burgess Creek on the west. The largest groups of beetle-killed trees were recorded along the Reservation/Lolo NF divide, near Blackrock Peak, and in the upper tributaries of Jocko River—especially Liberty Creek in the extreme southeastern corner

of the Reservation. Most recorded mortality was attributed to MPB, in LPP stands; however, notable groups of PP were also affected—some being killed by MPB, others by IPS, still others by WPB. Large groups of faders previously observed in Magpie Creek and lower Revais Creek drainages have declined in intensity, but have been replaced by larger groups in upper Revais Creek, South Fork Jocko River, and Jocko River drainages. In 2002, beetle-caused mortality had reported to the east in Dry Creek and Pistol Creek drainages, and near McDonald Lake. While we cannot be certain due to lack of data, beetle activity was likely still present in those areas.

The remainder of the Reservation was not flown in 2004; however, bark beetles were probably still active in the following areas—reported in 2002. In the northeast, MPB-caused mortality increased markedly from Hellroaring Creek, north to the Reservation boundary. Elsewhere, MPB activity in both LPP and PP stands was very generally scattered throughout the respective host types. Larger groups of LPP faders were noted south of Rainbow Lake, and significant amounts of PP mortality were observed in the Revais Creek drainage and near Saddle Mountain.

In the interior of the Reservation, important amounts of MPB- and IPS-caused mortality were found in PP stands near Sonyok Mountain and the Bison Range in the south, northward into the Salish Mountains, west of Loon Lake, and east of there in the vicinity of Jette Lake. In 2002, beetle activity was reported on Wild Horse Island and near Black Lake. That activity likely continued.

Scattered throughout mixed conifer stands were noticeable amounts of mortality attributed to DFB, FE, and WPB. Some SAF stands in the upper Jocko River drainage experienced mortality caused by WBBB. In portions of the Reservation, severe defoliation attributed to Douglas-fir tussock moth was recorded. Depending upon weather in the next year or so, some of those defoliated DF could be killed by DFB.

Total beetle-infested areas on the portion of the Reservation flown included 2,800 DF killed on 1,700 acres; 2,900 PP killed by MPB on 3,300 acres; and about 27,000 PP killed by IPS on approximately 14,000 acres. WBBB-caused mortality accounted for 2,500 dead SAF on 2,600 acres and FE killed almost 800 GF on 300 acres. The most significant damage recorded, however, was the 144,000 LPP killed by MPB on nearly 53,000 acres. That was nearly a two-fold increase over the 28,300 acres recorded in 2003; but to reiterate, much of the Reservation was not flown in either 2003 or 2004. Those estimates do not reflect damage that likely occurred in portions of the Reservation not flown.

Fort Belknap IR:

Conditions were little changed from those observed in the last couple of years. Very widely scattered and generally small groups of MPB-killed PP and LPP were mapped across the Reservation. Groups ranged in size from 1-150 trees, with concentrations noted near Thornhill Butte, Eagle Child Mountain, and near Mission Peak. Most of the latter were small groups of LPP. The largest of those contained an estimated 25 trees. About 530 PP were killed on slightly fewer than 160 acres. Another 125 LPP were killed on about 40 acres. Both of those figures represent nearly static conditions.

Northern Cheyenne IR:

Very widely scattered and small groups of PP, killed by IPS and MPB, were noted throughout the forested areas of the Reservation. Heaviest concentrations of MPB-killed trees were mapped in Tie Creek and East Fork Muddy Creek drainages, south and east of Lame Deer. Others were mapped south of Busby; but there were noticeable groups of IPS-killed trees throughout beetle-infested areas.

Reservation-wide, about 800 PP on 445 acres were recorded as having been killed by IPS. Another 1,250 PP on 664 acres were killed by MPB. The Reservation was not flown in 2003, but those are figures represent decreases in infested areas from those recorded in 2002.

Rocky Boys IR:

A few widely scattered, mostly small groups of PP, killed by MPB, were mapped throughout the forested area of the Reservation flown in 2004. Largest groups were observed in the Eagle Creek drainage and near Flying A Butte; however, they were much less significant than groups of beetle-killed LPP recorded in other susceptible stands. In 2004, small groups of mostly well-scattered beetle-killed LPP, were recorded in the central portion of the Reservation. Larger groups, one of 200 trees, were mapped near Black Mountain, in the East Fork of Beaver Creek, and near Lost Canyon. In recent years, fewer MPB-killed LPP have been recorded, perhaps in response to direct control measures implemented in some stands. Active management efforts have been largely successful in reducing beetle-caused mortality. A few small groups of DFB-killed DF were mapped near Centennial Mountain and east of Salt Coulee.

Slightly more than 600 beetle-killed LPP were mapped on about 200 acres—a marked decrease from the 1,100 acres reported in 2003. Another 260 PP were killed on 90 acres, but there may have been more beetle activity in PP stands than reflected in this year's estimates. DFB killed about 400 trees on 160 acres—a slight increase over data recorded last year.

National Parks

Glacier NP:

The Park was not flown in 2003 due to several fires that burned in the Park for much of the summer, so data collected in 2004 is comparable to that obtained in 2002. Within the past 2-3 years, wildfires have affected thousands of acres of forested stands, in the western, central, and southern portions of the Park. Associated with some of those were increasing amounts of DFB-caused mortality—observed in many widely scattered locations, but near many burned stands, particularly near Kintla, Bowman, Quartz, and Logging Lakes. In response to drought-induced damage, FE populations have built in GF stands at several locations in the Park. The largest of those was located in the Pinchot

Creek drainage. And MPB-killed LPP was noted in small and very scattered groups throughout LPP type.

Most significant amounts of beetle-caused mortality in the Park were large groups of SAF killed by WBBB. Largest of those was mapped near Logging Mountain; however, several other large groups were observed in high-elevation stands.

Park totals for 2004, included 5,100 DF killed by DFB on 3,300 acres; 4,800 GF killed by FE on 4,050 acres; 720 of various MPB hosts were killed on 850 acres; and WBBB killed 18,300 SAF on just over 8,200 acres. All outbreaks increased over previously recorded figures.

Yellowstone NP:

Because of inclement weather in August, the Park was not flown in 2004. In 2003, for the portion of the Park surveyed, large groups of WBBB-caused mortality were mapped in SAF stands throughout the Gallatin Range, in northwest portion of the Park. Largest groups were noted near Little Quadrant Mountain, Quadrant Mountain, Electric Peak, and Antler Peak. In that same general area, several large groups of WBP, killed by MPB, were also recorded. In the north central part of Park, from the Gardiner River east to Coyote Creek, numerous but small groups of DFB-killed DF were observed. Elsewhere in the northern portion of the Park, numerous small groups of WBP and LPP, killed by MPB, were widely scattered. A few larger groups of MPB-killed WBP were noted near Mount Washburn, Frederick Peak, Mount Hornaday, and Amethyst Mountain. Very expansive and intense MPB outbreaks in WBP had been reported south and east of Mount Washburn in 2003. In 2004, ground observations detected another very large outbreak in the vicinity of Avalanche Peak. Ground-collected data in that area showed an average 95 WBP per acre killed within the past 2-3 years.

A significant outbreak of ESB was believed to have continued in Columbine, Beaverdam, and Rocky Creek drainages, east of Yellowstone Lake. That outbreak expanded markedly from 2002 to 2003. In the southeastern portion of the Park, large groups of WBP, killed by MPB; and SAF, killed by WBBB had been observed. The largest groups of the former were on the Two Ocean Plateau. Those conditions worsened in 2003 and likely continued in 2004.

Throughout the rest of the Park, widely scattered and mostly small groups of SAF, LPP and WBP faders were mapped in 2003. More significant amounts of SAF mortality, attributed to WBBB, were noted along Big Game Ridge and in the upper Snake River drainage, east of the Park's south entrance.

Beetle-killed totals for the Park, in 2003, included 3,300 DF—attributed to DFB on 1,130 acres; 18,060 ES on 8,750 acres killed by ESB; 1,010 LPP on 700 acres killed by MPB; 27,900 WBP killed by MPB on 15,100 acres; and finally, 10,500 SAF were killed by WBBB on 6,390 acres. The biggest increases were noted in ESB and MPB activity. Once again, we are confident the MPB outbreaks in WBP expanded considerably.

BARK BEETLE-RELATED SPECIAL PROJECTS--MONTANA

Assessing the Effectiveness of Management Activities on DFB Populations:

A multi-year study, begun in 2002, will help determine effectiveness of management activities on DFB populations, and particularly ones existing in areas recently affected by fire. Beetle-infested stands on the Bitterroot, Helena, and Beaverhead NFs; as well as BLM-administered land near Boulder, were assessed for beetle presence and status prior to implementation of management efforts. Those efforts included salvage of infested and threatened trees, use of trap trees or baited funnel traps, and the use of the DFB anti-aggregant, MCH. Management activities were implemented in 2002, 2003, and 2004. Data were collected following implementation of management and subsequent beetle flights in each year.

Although not all proposed and scheduled activities have been carried out, in areas where salvage logging was conducted, and in most areas where funnel traps were used, beetle-caused mortality was markedly reduced in all 3 years. In areas where MCH was used to protect threatened trees or stands, treatments were deemed successful. In almost none of the treated areas was new beetle-caused mortality observed.

DFB populations are beginning to decline in many treated areas. In a few, pheromone-baited funnel traps and MCH may once again be used in 2005 to reduce anticipated DFB-caused mortality. In other areas DFB populations are sufficiently low that additional treatments are not warranted. Following evaluations this fall (2004), overall affects of three post-fire year treatments will be reported. For additional information, contact Nancy Sturdevant, Missoula Field Office (MFO).

Testing the Effectiveness of Pheromone-Baited Funnel Traps in Reducing DFB-Caused Mortality in Nearby Stands of Susceptible DF:

Cooperative project with Rob Progar (PNW, Corvallis, OR) determining the effectiveness of funnel traps in reducing DFB activity. Trying to determine if we can suppress DFB populations and/or reduce beetle-caused mortality with funnel traps. We used triplets of baited traps—three sets of three traps placed 200 meters apart in “triangular” pattern on two RDs—Wisdom and Philipsburg (Beaverhead-Deerlodge NF). After beetle flight, we surveyed interior of “triangle” to see if DF mortality was reduced by trap catches. Trapped literally millions of beetles; but found quite a bit of tree mortality as well. Data to determine treatment effectiveness is being analyzed. For additional information, contact Nancy Sturdevant, MFO.

Can Pheromone Trap Catches Reduce DFB-Caused Mortality:

Cooperative project with Kimberly Wallin (OSU, Corvallis, OR) in trying to determine how much DFB-caused mortality occurs around pheromone-baited funnel traps—and if trap placement affects mortality in adjacent DF stands. Ten pairs of traps, in 2 DFB population densities (moderate and high) placed in DF stands in southwestern Montana (Sula and Stevensville RDs, Bitterroot NF). Trap catches are being analyzed. Project will run through 2005. For additional information, contact Ken Gibson, MFO.

Testing Efficacy of Verbenone Pouch in Reducing MPB-Caused Mortality in PP:

A project was conducted in PP stands on the Plains/Thompson Falls RD to help determine the efficacy of the standard, 5-gram verbenone pouch compared to a new “slow-release” pouch in protecting trees from MPB attack. In a randomly assigned treatment (by block) test, we treated three 1-acre plots in each of 6 blocks. Treatments consisted of 0, 20 standard (Phero Tech), or 40 new (slow-release, Biota) pouches per acre. Pouches were stapled to individual trees in a grid pattern (approximately ½-chain apart at 40/acre; about ¾-chain apart at 20/acre). A baited funnel trap was hung at the center of each plot. Stands were treated in late June and evaluated in late September. The standard pouches were replaced at the end of July. Treatment results were not as we had hoped because of beetle populations too low to make valid comparisons between treatments. For additional information, contact Ken Gibson, MFO.

West-Wide Evaluation of Bifenthrin as a Protectant Against Bark Beetle Attacks: Second-year Results

As part of a multi-Region study, we conducted a preventive spray treatment in MPB-susceptible LPP stands on Jefferson RD. We selected 210 live LPP, at least 8 inches d.b.h., in early June 2003. Selected trees were randomly assigned to one of six groups, each of which would receive a different “treatment.” Six treatments were: 0.03% bifenthrin (Biflex), 0.06% Biflex, 0.12% Biflex, 2% carbaryl, 2003 control (no spray) and 2004 control (no spray, reserved for second year of study).

Trees were treated in mid-June. Mixtures were water-based sprays, applied with hydraulic sprayers. Tree boles were treated to a point of runoff, to a height of about 25 feet. Following treatment, a standard MPB tree bait was attached to each tree (except trees reserved for 2004). Treatment effects were evaluated in late-September 2003. First-year results showed weaker concentrations of Biflex provided poor protection from MPB attack; highest concentration (0.12%) was moderately successful. Carbaryl provided excellent protection. Results are shown in table below.

	Contro l '03	0.03 % Biflex	0.06 % Biflex	0.12 % Biflex	2% Carbaryl 1	Bifle x '04	Carbaryl 1 '04	Contro l '04
Attacked	31	29	22	6	1	24	3	25

No Attk	2	6	10	25	34	9	30	9
% Alive	6	17	31	81	97	17	91	16

In June 2004, the 25 trees remaining alive in the Biflex (0.12%) group, the 34 in the Carbarly group, and the 35 2004 controls were baited with MPB tree baits. Second-year protection was evaluated in September. For additional information, contact Ken Gibson, MFO.

Testing Efficacy of Onyx, Sevin, and Permethrin +C in Protecting Individual LPP from MPB Attack:

In mid-June, 150 LPP were selected as part of an evaluation of another potential replacement for Sevin (carbaryl) insecticide in protecting individual LPP from MPB attack. The insecticide under evaluation was Permethrin +C, a synthetic pyrethroid. In addition, we again evaluated the registered rate (0.06%) of Onyx (bifenthrin); and we applied 2% as the “standard.” Control trees were selected for both 2004 and 2005 (second-year protection). This project was under the direction of Chris Fettig, Research Entomologist, PSW, Davis, CA.

Trees were selected on the Jefferson RD, Beaverhead-Deerlodge NF, east of Butte. Groups of thirty trees each, comprised five treatments: 0.06% Onyx, 0.2% Permethrin +C, 2% carbaryl, check ('04), and check ('05). Trees were treated June 15-17 and evaluated in mid-September, following beetle flight. Results are shown in table below.

	Control	Onyx	Perm. +C	Carbaryl
Attacked	30	1	2	0
Not Attacked	0	29	28	30
% Mortality	100	3.4	6.7	0

Trees will be re-baited in 2005. For additional information, contact Ken Gibson, MFO.

Testing Efficacy of Verbenone Pouch in Reducing MPB-Caused Mortality in LPP:

An individual-tree test was conducted in LPP stands near Corona Divide, Plains/Thompson Falls RD; testing efficacy of standard (Phero Tech) 5-gram verbenone pouch and a “new” (slow-release, Biota) pouch in reducing MPB-caused mortality in high-value trees. Trees were selected and treated in late June. Test was comprised of three treatments: 2 standard pouches per tree, 2 “new” pouches per tree, and none (controls). Fifty trees were selected for each treatment. All 50 trees were baited with standard MPB tree baits. Standard pouches were replaced in late-July; project results being determined in September. Treatments, not statistically different from each other, successfully protected trees from beetle attack, when compared to untreated controls. Following table illustrates those results:

Treatment	Not attacked¹	Strip attack²	Mass attack³	% Attacked
Control	0	5	45	100
Standard	24	11	15	30
New	24	12	14	29

¹ No or unsuccessful (pitch outs) attacks

² “Strip attacks” were partial attacks and were not killed

³ Only “mass attacks”—trees actually killed—contributed to “% attacked”

For additional information, contact Sandy Kegley, Coeur d’Alene Field Office (CFO).

Comparison of Two New MCH Products—An Observation:

In an area on Sula RD (Bitterroot NF) where large-diameter, older DF dominated stand conditions, and which was heavily infested by DFB; we conducted a side-by-side comparison of two MCH products, available for the first time in 2004. We compared them to the “standard” MCH bubble capsule, registered by Phero Tech, Inc.; and which has been used extensively, operationally, for several years.

In each of three 5-acre stands, we placed 30 MCH bubble capsules per acre—the registered and recommended rate. Randomly assigned to the adjacent blocks were one of three treatments: Standard Phero Tech bubble capsules, bubble capsules manufactured by Biota Control, and ones manufactured by Hercon Environmental. All bubble capsules were of similar construction and contained equal amounts of liquid MCH.

Bubble capsules were installed in stands in late-April. An adjacent, un-treated stand of similar conditions served as a “control.” Treatment effectiveness was evaluated in late-September. DFB populations declined in that general area in 2004. In the untreated stand, we found but 4 new, DFB-killed trees. But we found no new attacks in any of the treated areas. While the “observation” was not established to be a replicated study, we were hopeful of demonstrating the effectiveness of MCH products new to the market. We believe they were effective. Neither has yet been registered for operational use, but that may be forthcoming. For additional information, contact Ken Gibson, MFO.

BARK BEETLE CONDITIONS IN IDAHO

Clearwater Reporting Area

Pierce RD:

Many bark beetle-killed trees were mapped on the District in 2004. Several host species were involved, and so a number of bark beetles were represented. Most groups of beetle-affected trees, however, were small and generally well-scattered throughout the District. DFB-killed trees were most often encountered, but there were many small groups of WWP and LPP, killed by MPB, FE-killed GF, and SAF, killed by WBBB. Notable concentrations of dead trees were observed in French Creek and Hemlock Creek drainages, east of Pierce. A large group of MPB-killed PP was mapped near Sylvan Saddle. Extremely large groups of FE-killed GF were observed south and east of Weippe on mostly State or private lands.

Balsam woolly adelgid (BWA) has been attributed with killing many SAF in areas east of Pierce and south of there, east of Weippe. Many WWP have been adversely affected by blister rust throughout the District. It is likely some of the mortality attributed to BWA or blister rust may also be bark beetle related. District totals are combined with North Fork RD (below).

Palouse RD:

Extremely high amounts of FE-caused mortality in GF stands were mapped throughout the District, on lands of varying ownerships. Largest concentrations were on State and private land in the Meadow Creek drainage, east of Potlatch; however, most GF stands in the reporting area were affected to greater or lesser extents. Significant numbers of DFB-killed DF were noted in tributaries of North Fork Palouse River, near Baby Grand Mountain; and North Fork Clearwater River, south of Elk River. Other beetle-killed groups of DF were widely distributed throughout the reporting area.

Other relatively minor amounts of mortality were attributed to WPB and BWA; but throughout the reporting area, most beetle-caused mortality was attributed to FE. On lands of all ownerships, FE-caused mortality totaled an estimated 18,000 trees on 19,100 acres—up significantly from the 2,700 acres reported in 2003. Although of considerably less significance, DFB killed about 4,000 DF on 900 acres—also an increase from last year.

North Fork RD:

Although bark beetle-caused mortality was found very generally throughout the District, and several bark beetle species were responsible for observed mortality; the most significant amounts continued to be caused by MPB in LPP stands in the upper North Fork Clearwater River drainage, near the Idaho/Montana border south of Hoodoo Pass. Those infestations continued to expand in 2004. Mortality attributed to WBBB—a few larger groups in upper Meadow Creek drainage, FE, and DFB—most concentrated in

tributaries of North Fork Clearwater River, near Benton Butte north of Aquarius Campground, was more widely scattered. In total, bark beetle-caused mortality was significant, but large concentrations, except as noted, were few.

Although FE-killed GF was scattered throughout the reporting area, there was less mapped than in 2003. Noticeable amounts of dead SAF were observed. Some of that mortality was attributed to BWA, some to WBBB. There may also be other mortality factors involved.

Very large groups of blister rust-affected WWP were mapped along Independence and Deadwood Ridges, north of Ruby Point. Many of those rust-impacted trees were likely also infested, and in some cases, killed by MPB.

District-wide (including Pierce RD), bark beetle-caused mortality totaled: 2,000 DF killed by DFB on 1,300 acres (up from 925 acres in 2003); 9,300 LPP, 329 PP, and 125 WWP killed by MPB on a combined 5,900 acres (4,200 acres last year); 6,900 SAF killed by WBBB on 3,600 acres (3,000 acres in 2003); and about 7,100 GF killed by FE on more than 16,800 acres (11,225 acres had been infested in 2003). BWA was recorded on another 15,300 acres (up from 7,500 acres) and blister rust was reported to have impacted WWP on almost 5,000 acres. Many of those affected trees may also have been infested by bark beetles.

Lochsa RD:

In 2004, there appeared to be a continued decline in amounts of DFB-killed DF. DFB-caused mortality was mapped in a widely scattered manner, in mostly small groups, throughout the reporting area. Notable concentrations were lacking. Generally scattered throughout the reporting area on FS-administered lands were small groups of FE-killed GF. Most were found north of the Lochsa River. A very large group of GF, killed by FE, was mapped on State land in the Maggie Creek drainage, east of Kooskia. South of the Lochsa River, large groups of BWA-infested SAF were found. As in other areas, those damaged trees likely also harbored populations of bark beetles.

In many high-elevation SAF stands, damage attributable to both BWA and WBBB was significant, and totaled more than 18,000 acres (10,400 acres in 2003) combined. Other District totals (including Powell RD) showed about 4,200 DF killed on 2,100 acres (only 200 acres reported last year); 2,400 LPP, PP, WBP and WWP killed by MPB on a combined 1,350 acres (75 acres recorded in 2003); 5,300 SAF killed by WBBB on 2,400 acres (60 acres in 2003); and 3,000 GF killed by FE on approximately 9,200 acres (4,580 acres last year). Another 15,600 acres were affected by BWA and 150 by blister rust.

Powell RD:

Many small and widely scattered groups of DFB-killed DF were mapped along White Sand Creek, the Lochsa River, Squaw Creek and Badger Creek, and many of their tributaries; from just below Lolo Pass to Skookum Creek, in 2004. A larger group, of 200 trees was noticed near Squaw Saddle. The infestation has declined recently, but current faders were still very noticeable. WBBB-killed SAF were prevalent from the

confluence of White Sand and Crooked Fork Creeks, south to Elk Summit. District totals are included with those of Lochsa RD.

Significant amounts of bark beetle-caused mortality for the portion of the Clearwater Reporting Area flown totaled 10,500 DF on 4,350 acres (1,500 acres in 2003); 31,300 GF on 51,500 acres (19,750 acres in 2003); 12,100 SAF on 6,100 acres (3,000 acres last year); and more than 12,100 MPB hosts killed on just less than 7,400 combined acres (4,200 acres last year). For the reporting area, most beetle-affected areas increased in 2004.

Idaho Panhandle Reporting Area

Coeur d'Alene NF (Coeur d'Alene River RD):

Large groups of LPP, killed by MPB, were once again recorded just west of Lookout Pass. While most have decreased in size since 2002, there was a slight increase in 2004. These outbreaks have been concurrent with extensive MPB outbreaks existing throughout many LPP stands in western Montana. Other, smaller groups of MPB-killed LPP were found in eastern portions of the District, but at generally lower levels than the past few years.

Other MPB-caused mortality was recorded in WWP stands, but at reduced levels from those reported in 2003. However, groups of WWP with damage attributed to blister rust were much more noticeable throughout WWP stands east of Coeur d'Alene in 2004. It is very probable that most of those stands were also infested by MPB. Largest of those groups were near Lost Peak, then northward to Little Guard Peak, Downy Peak, and East Cathedral Peak.

Small groups of DFB-killed DF also widely scattered throughout mixed-conifer and DF types; but damage was much reduced from a few years ago. Large amounts of FE-caused mortality were very widely distributed throughout stands in which GF was prevalent—especially on private land south and east of Coeur d'Alene. The largest of those groups, greatly expanded from 2003, were found in North Fork Coeur d'Alene River drainage, from Huckleberry Mountain east to Tepee Summit. Many of those groups covered several thousand acres each. SAF, killed by WBBB, were also noted at some locations. One especially large group of WBBB-killed SAF was mapped in the upper reaches of Canyon Creek, west of Cooper Pass.

District totals, on lands of all ownerships, showed DFB-infested area remained at about the same level as recorded in 2003 when 1,500 acres were mapped. In 2004, that figure decreased slightly, to just over 1,400 acres. In that infested area, approximately 5,100 DF were killed. An estimated 1,300 SAF were killed by WBBB on about 1,550 acres—compared to 900 acres last year. Significant increases in FE-killed GF were noted. In 2003, an estimated 9,600 trees were killed on 2,260 acres; those increased to 27,100 trees on 28,000 acres in 2004. MPB-killed WWP declined from an estimated 2,600 trees on 1,700 acres to 800 trees on 450 acres; however, blister rust was attributed with damaging WWP on more than 14,000 acres. MPB-caused mortality in LPP increased slightly from

8,900 trees on 2,050 acres to 16,000 trees on 3,500 acres. WPB and IPS accounted for another 2,100 beetle-killed PP on about 680 acres.

Kaniksu NF (Sandpoint RD):

Acres on which DFB-caused mortality was recorded, decreased substantially in 2003; and mortality in GF stands attributable to FE also showed a marked decrease from 2003 levels. The latter was still found at very high levels in much of the reporting area, but on less than half the total acres affected in 2003. Numerous and fairly large groups of GF faders were noted from about Sand Mountain on the north, to Sugarloaf Mountain on the south. Highest concentrations were mapped east of Lake Pend Oreille in Rapid Lightning Creek and Grouse Creek drainages. DFB-and FE-caused mortality was also widely scattered throughout the area north and east of Sandpoint, but groups there were generally smaller and less frequently observed.

Noticeable amounts of WPB-killed PP were observed to the south and west of Sandpoint. In past years, some of that mortality has been attributed to MPB. It is likely that both beetles were active in that area. MPB-killed WWP, as well as stands affected by blister rust were observed in the eastern portion of the District, especially in Rapid Lightning Creek drainage. Minor amounts of MPB-killed LPP were noted at a few locations.

District-wide, 600 acres were still infested by DFB, compared to 2,500 acres in 2003. Only about 800 DF had been killed. FE killed an estimated 14,000 GF on about 9,400 acres. More than 18,300 acres had been infested last year. MPB killed 630 trees—530 LP, the remainder PP and WWP—on about 380 acres. WBBB-caused mortality totaled 1,290 trees on less than 1,000. About 1,620 acres had been recorded in 2003. Other bark beetle activity was less significant.

Kaniksu NF (Bonners Ferry RD):

Widespread and significant amounts of FE-caused mortality in GF stands were still found in much of the southeastern part of the District, but fewer beetle-killed trees were recorded there than in 2003. The northeastern portion of the District, however, from North Fork Grouse Creek on the south, nearly to the Canadian border, where most stands with a GF component appeared to be affected to some extent in 2003, were not flown in 2004. In 2003, largest groups were in Deer Creek drainage, throughout the Meadow Creek drainage, and near Solomon Mountain. Outbreaks likely continued there. Throughout the District in 2003, more than 6,670 GF were killed on nearly 6,830 acres. Because so little of the area was flown in 2004, those figures were reduced to 3,300 trees on 3,750 acres.

Elsewhere, in 2003 scattered throughout the Purcell Mountains, in high-elevation SAF stands, WBBB-caused mortality was prevalent. Particularly large groups were noted near Bussard Mountain, Queen Mountain, and Wall Mountain. In 2003, only the areas around Black Mountain and Katka Peak were surveyed. They still contained significant amounts of WBBB-killed SAF. DFB-caused mortality was much less commonly observed, but was noticeable in a widely scattered pattern in the southeastern part of the District. LPP, killed by MPB was prominent in stands in McGinty Creek and Boulder Creek drainages.

In that same general area, but at lower elevations, a few MPB-killed PP were also observed.

To the west of the Kootenai River Valley, in the Selkirk Mountains, MPB-caused mortality in WBP, WWP, and LPP stands was extreme; and expanded once again in 2004. WBBB-killed SAF were also mapped in very large groups at higher-elevation sites throughout the Selkirks, northward from Bottleneck Peak to the Canada/US border. MPB-caused mortality in WBP stands along Russell Ridge, Burton Ridge, and near Pyramid Peak remained extremely high, but has declined slightly due to depletion of susceptible hosts. North of there, beetle-caused mortality was generally expanded in extent and intensity throughout LPP, WBP, and WWP stands.

Throughout the portion of the District flown, more than 32,700 WBP; 28,000 LPP; and 250 WWP were killed in 2003, and mapped as faders in 2004. Total acres affected by MPB, in all hosts, was more than 36,500 acres. Those figures were reduced from ones recorded in 2003, but a significant portion of the District was not flown this year. WBBB, mostly in the area from Pyramid Peak to Bottleneck Peak, killed more than 35,400 SAF on 20,300 acres. Those represented significant increases in MPB and WBBB activity.

Kaniksu NF (Priest Lake RD):

West of Priest Lake, from south of the Pend Oreille River north to High Rock Mountain; and on the eastern side of the Lake, from Coolin Mountain to Lookout Mountain, very high amounts of FE-caused mortality and decreasing amounts of DFB-caused mortality were observed in 2004. Total GF mortality, attributed to FE, totaled more than 16,000 trees on just less than 13,000 acres, whereas only 5,570 acres had been reported in 2003. DFB-infested stands declined to less than 700 acres, compared to 2,600 acres last year.

Also throughout that general area, blister rust-caused damage was prevalent in WWP stands. Many of those were also impacted by MPB. WBBB-caused mortality was also prevalent throughout the reporting area—especially near Snowy Top, Little Snowy Top, Shedroof, Thunder, Round Top, Grassy Top, Little Grass, Boulder, and Monumental Mountains. More than 6,050 acres (6,300 acres in 2003) were infested, on which an estimated 10,400 SAF were killed. That figure was also reduced in 2004.

Totals for all three Districts in the Kaniksu Reporting Area showed 3,100 DF killed on 1,800 acres (down from 5,660 acres in 2003); FE killed 55,600 GF on 65,800 acres (nearly twice the 36,900 acres recorded in 2003); MPB killed 124,000 trees (about one-third of which were WBP, most of the rest LPP) on 38,000 acres (down slightly from 42,500 acres in 2003, but not all infested areas were flown); and WBBB killed 48,400 SAF on 27,800 acres—only about half the 51,800 acres reported last year.

St. Joe NF (Avery/St. Maries/Red Ives RD):

Decreasing amounts of MPB-caused mortality in LPP stands were mapped along the eastern portion of the reporting area, along the Idaho/Montana border. In that area, there were fewer and generally smaller groups than mapped in 2003. Highest concentrations of

beetle-killed trees noted from Sherlock Creek, northwestward Elbow Gulch; however, fader groups were somewhat scattered in that general area along the border. Largest groups were mapped near Cascade Peak and Summit Springs. Elsewhere throughout the District, LPP stands in many of the tributaries of the St. Joe River were lightly infested. Total MPB-infested area, recorded in 2004 was 8,500 acres (down significantly from the 20,750 acres recorded in 2003), with tree mortality totaling 18,400 trees. More than 95% of those MPB-killed trees were LPP. An additional 4,800 acres of WWP have been impacted by blister rust. Likely, MPB populations were affecting those stands as well.

DFB-caused mortality was still observed, but to a less significant extent in a few tributaries of the St. Joe River, east of St. Maries. Elsewhere, it was widely scattered in small groups throughout DF type, but at a reduced level from that recorded in 2003. In 2004, the infested area was reduced to only 630 acres—down from 3,400 acres last year. FE-caused mortality increased somewhat in 2004, up from 10,500 acres recorded in 2003. This year, FE-killed GF were reported on 15,100 acres throughout the reporting area. An estimated 15,000 GF were killed. Most of that mortality was widely scattered in relatively small groups throughout the St. Joe River drainage, although it was more noticeable in Mosquito Creek and St. Maries River drainages.

Significantly fewer acres of SAF—affected by both BWA and WBBB were reported in 2004. In 2003, more than 54,000 acres of SAF type, throughout the southern portion of the reporting area, had been reported as infested by BWA where an estimated 25,500 trees had been killed. In other stands, totaling about 5,600 acres and 5,200 trees, SAF mortality has been attributed to WBBB. In 2004, those figures were 2,020 trees on 8,250 acres for BWA and 1,920 trees on 1,120 acres for WBBB. In many of those stands, trees have likely been impacted by both.

Throughout the IPNF Reporting Area, more than 3,800 acres (7,200 acres in 2003) were still infested by DFB. In 2003, 66,700 acres were affected by MPB, in all of its hosts. That had been reduced to 50,600 acres in 2004. Last year, 49,600 acres showed some level of FE-caused mortality; that more than doubled in 2004 to 108,950 acres. And the 58,600 acres infested by WBBB in 2003 decreased to 30,500 acres in 2004. All totaled, more than 327,600 trees were killed on bark beetle-infested acres in 2003, recorded as faders in 2004.

Nez Perce Reporting Area

Salmon River RD:

Seven Devils Mountains and Hells Canyon Wilderness Area was not flown in 2004, but most of the rest of the District was. DFB activity, once prominent throughout mixed-species stands, has declined to nearly an endemic level. West of Riggins, from White Bird Ridge, north to the District boundary near Poe Creek, FE-killed GF were common throughout the host type. Some of the largest groups were mapped near Morrison Ridge, above Cabin Creek, near Homer Springs and Grave Point. North of there, on State and private lands west of Grangeville, in the Joseph Plains, numerous large groups of GF, killed by FE were also mapped. Some of the larger groups in that area were found near

Pilgrim Ridge and above Mahoney Creek. Throughout that entire portion of the reporting area, extremely high amounts of FE-killed GF were recorded. East of the Salmon River, from Riggins north to District boundary, many more groups of FE-killed GF were mapped, but they were generally smaller and less numerous than to the west. The largest groups were mapped west of Slate Creek, within tributaries of Slate Creek.

Throughout the reporting area, groups of WBBB-killed SAF were reported at higher elevations; however, they too appeared to be less numerous than in past years. Some of the larger groups were near Looking Glass and Umbrella Buttes. In those same general areas, large groups of SAF were mapped in which damage was attributed to BWA. Largest of those groups were observed above Little Slate Creek, along Brushy Ridge, and near Dead Point. Many of those SAF may also have been affected by WBBB.

Widely scattered and small groups of MPB- and WPB-killed PP were recorded in stands on the southern portion of the District, above the Salmon River. They were much less numerous than the ubiquitous amounts of FE-killed GF. DFB-killed DF, once common throughout the District, was little noted.

Throughout the District, on a total of 6,100 acres, FE killed more than 7,900 GF. WBBB killed 900 SAF on 620 acres; and MPB hosts killed totaled 6500 trees (mostly PP) on about 350 acres. Minor amounts of other beetle-caused mortality were reported. Most bark beetle activity was static to slightly declining from levels reported last year.

Clearwater RD:

Unusually high amounts of FE-killed GF were once again located in many of the tributaries of South Fork Clearwater River and White Bird Creek, south and east of Grangeville. Other GF stands, heavily infested by FE, were noted throughout the reporting area. District-wide, those infested areas totaled 9,960 acres (compared to only 1,700 acres in 2003), on which 14,200 GF were killed. Small amounts of MPB-killed PP were reported—920 trees on 260 acres—especially northeast of Grangeville. Many WWP stands have been impacted by blister rust, some of which may also contain MPB-caused mortality. LPP mortality, attributed to MPB totaled 1,700 trees on about 900 acres scattered through susceptible type in small groups. DFB-impacted DF has declined to endemic levels.

Red River/Elk City RD:

Very high amounts of MPB-killed LPP were noted throughout the combined Districts, but at a much-reduced level than recorded in 2003. Host depletion, and stand management, is continuing to mark the decline of the most widespread MPB outbreak in the Region. Most LPP stands in the Red River, American River, Newsome Creek, and South Fork Clearwater River drainages, and their tributaries, have been affected to some extent. Most areas still harbored active outbreaks, but at a much less intensive level. The most intensive outbreaks—some to 5 beetle-killed trees per acre—were mapped to the north and south of Elk City. However, the largest polygons—some extending for thousands of acres, but at intensity levels of but one tree per acre—were recorded south and east of Red River. Those extensive areas covered much of the LPP type from

Blowout Mountain, northeastward to Three Prong Creek. Generally, numerous fader groups were mapped throughout the Districts from Salmon River on the south, nearly to Iron Mountain on the north; and from Windy Saddle on the east, west to the confluence of Silver Creek and South Fork Clearwater River. This outbreak remained the most extensive and damaging one in the Region. On the two Districts, an estimated 427,000 LPP were killed on just over 147,500 acres. Slightly more than 101,900 acres were recorded in 2003, but on those acres, considerably more trees had been killed. At several low-elevation sites throughout the reporting area, MPB has killed noticeable amounts of PP, totaling about 600 trees on 300 acres.

At several high-elevation sites in the reporting area, large groups of WBBB-killed SAF were also noted. They were more prevalent in the western portion of the Districts. About 3,700 acres were infested; and an estimated 5,300 SAF were killed. Both those figures are slightly higher than recorded in 2003. To the north and west, in GF or mixed-species stands, FE-killed GF were noted in mostly small and widely scattered groups. Those totaled close to 800 acres, on which about 1,000 GF had been killed. DFB-caused mortality has declined to approximately 1,100 trees on 300 acres.

Moose Creek RD:

Only a small portion of the District (northwest of Big Fog Saddle) was flown in 2004, and most was not flown in 2003. The widely scattered and mostly small groups of DF, killed by DFB, mapped along the Selway River in 2002 likely continued to decline in 2004. District totals for DFB-infested stands were around 1,000 acres in 2002. Elsewhere in 2002, MPB killed about 2,100 LPP on 3,400 acres and WBBB killed 200 SAF on 825 acres. A small group of MPB-killed LPP was noted in the area flown in 2004. That totaled about 350 trees on 200 acres.

For the entire Nez Perce Reporting Area, the most significant beetle-related mortality was attributed to MPB in LPP stands. More than 159,200 acres were infested (111,300 acres were mapped in 2003), and about 463,700 trees were killed—nearly the same total as last year. MPB also killed 3,000 PP on 1,500 acres—a decline from the 5,160 acres recorded in 2003. Other bark beetle-caused mortality of significance: FE killed more than 35,300 GF on 25,400 acres (compared to 20,100 infested acres last year); WBBB killed 7,200 trees on 5,100 acres—very similar figures to those recorded in 2003; and DFB-caused mortality totaled only 2,200 trees on 630 acres, a notable decline. Of less importance: WPB killed more than 250 PP on 200 acres and IPS killed 700 PP on 140 acres. Most infestation totals were reduced from 2003 levels.

Indian Reservations

Coeur d'Alene IR:

Coeur d'Alene IR showed still high amounts of GF killed by FE, but at a less-significant increase than noted in 2003. Extent of those outbreaks had increased in 2003, and at that time, there were few mixed-conifer stands not affected to some degree. Fader groups in 2004 generally ranged from 5 to 50 trees; however, one large group west of Plummer

numbered 500 trees. Many large groups were recorded on lands of mixed ownership, just outside the Reservation boundary, south of St. Maries in the St. Maries River drainage. In total, nearly 6,700 GF were killed on 3,400 acres—a slight increase from the total recorded in 2003.

Small groups of PP, killed by WPB and DF, killed by DFB, were noted at various locations, but were much less insignificant when compared to the amount of FE-caused mortality distributed throughout the area. A few groups of WPB-killed PP were concentrated just south of Lovell Valley. A total of 1,260 PP were killed by WPB on about 900 acres. Lesser amounts of DFB- and IPS-caused mortality were observed.

Nez Perce IR:

Many large groups of GF, killed by FE, were mapped in the Waha Mountains, south of Lewiston. Most groups once again increased in size and intensity in 2004. Many covered several hundred acres each. While trees killed per acre were not high, total number of trees killed in the reporting area numbered in the thousands. The largest groups were mapped in Eagle Creek, Mission Creek, and Webb Creek drainages and their tributaries again in 2004. Several large groups, though generally smaller and less numerous, were mapped west of Cottonwood, near Cottonwood Butte. Other smaller groups of FE-killed trees were found throughout host type on the Reservation. Across the IR, more than 26,000 GF were killed on 75,140 acres. That represented a significant increase over the 52,300 acres recorded in 2003.

At various sites in the reporting area, numerous but small groups of PP were killed by WPB. Those totaled 2,840 trees on 2,400 acres—about half the infested area in 2003. In addition, a large group of MPB-killed LPP was mapped southwest of Soldiers Meadow Reservoir. That group increased in size in 2004. There about 5,400 LPP were killed on 3,400 acres. That infestation had been estimated at 2,000 acres last year. Throughout the Reservation, IPS activity accounted for 175 dead PP on about 70 acres. DFB killed another 265 DF on about 75 acres. Both those latter estimates were lower than recorded in 2003.

BARK BEETLE-RELATED SPECIAL PROJECTS--IDAHO

An Operational Case Study: Using Verbenone to Protect High-Value Lodgepole Pine Leave Strips at Lookout Pass Ski Area, Idaho—2003 and 2004:

Threatened by a large and expanding MPB outbreak, LPP “leave strips” between runs at Lookout Pass Ski Area were treated with verbenone pouches, in both 2003 and 2004, in an effort to reduce beetle-caused mortality. Verbenone pouches were placed throughout the susceptible, and at-risk, LPP leave strips at a rate of 20 per acre. Approximately 40 acres were treated in mid-May. Pouches were replaced in late-July.

Evaluation of treatment effectiveness was conducted in September, both years. Data for 2003 revealed very few new attacks in verbenone-treated strips. Data for 2004 was equally satisfactory, with only a few attacks in a treated area adjacent to an untreated one that was heavily infested. Surveys conducted in untreated LPP stands nearby revealed a significantly higher number of new attacks in those areas than in treated areas.

Verbenone treatments were considered to be successful and may be repeated so long as beetle populations remain high in that area. A more detailed report is forthcoming. For additional information, contact Carol Randall, CFO.

Testing Efficacy of Verbenone Pouch in Reducing MPB-Caused Mortality in WBP:

An individual-tree test was conducted in WBP stands near Fisher Peak, Bonners Ferry RD, IPNF; testing efficacy of a “new” (slow-release, Biota) pouch in reducing MPB-caused mortality in high-value trees. Trees were selected and treated in mid-June. Test was comprised of two treatments: 2 “new” (Biota) pouches per tree, and none (controls). Fifty trees were selected for each treatment. A standard MPB tree bait was placed on a non-host tree near each treated and control tree. Project results were determined in September. Verbenone treatment successfully protected trees from beetle attack, when compared to untreated controls. Following table illustrates those results:

Treatment	Not attacked¹	Strip attack²	Mass attack³	% Attacked
Control	8	0	27	77
Verbenone	29	3	5	13

¹ No or unsuccessful (pitch outs) attacks

² “Strip attacks” were partial attacks and were not killed

³ Only “mass attacks”—trees actually killed—contributed to “% attacked”

For additional information, contact Sandy Kegley, CFO.

Myrtle Creek Verbenone Treatment:

A wildfire in Myrtle Creek drainage, Bonners Ferry RD burned from September 2-9, 2003. The fire occurred in a critical watershed for Bonners Ferry's water supply and in a harvest area that was partially cut to preserve large-diameter PP on site. In early October, new MPB attacks were found in many of the partially burned PP. To prevent further beetle attacks, about 200 acres with partially burned, large-diameter PP were treated with verbenone in June 2004 at a rate of 20 pouches per acre. Verbenone pouches were re-applied mid-season. The area was evaluated in September to determine status of beetle attacks. The most abundant beetle found was RTB—in 28% of the PP examined. About 1% were currently infested with WPB. About 3% were unsuccessfully attacked by MPB, but we found no trees currently infested with MPB. For additional information, contact Sandy Kegley, CFO.

Hope 44 WPB Trap-Out:

The Hope 44 fire occurred in 2002 and burned through Kirby's wildlife cutting unit (Sandpoint RD). It was harvested to improve big game winter range and to restore the vigor of large-diameter PP by removing competing smaller-diameter DF. The fire killed many of the remaining DF and cedar in the area, but most of the PP survived. In winter 2003-2004, WPB were discovered infesting most of the partially burned PP. The burn was adjacent to an old-growth PP stand and there was concern WPB would move from partially burned trees into the old growth. It was not possible to remove infested trees prior to beetle flight in the spring, so we tried trapping out beetles using pheromone-baited Lindgren funnel traps. Fifteen groups of 3 traps each (total of 45 traps) were placed throughout the affected area. Over 14,000 beetles were collected (all samples have not been counted yet). Only 2 trees were found currently infested by WPB this fall. We concluded the trapping effort was successful in maintaining old-growth PP on the site. For additional information, contact Sandy Kegley, CFO.